Mini System PHIL-05111 **FW670P**

/21/22/41

Service
Service
Service

Service Manual

COMPACT
disc
DIGITAL AUDIO

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CLASS 1
LASER PRODUCT
3122 110 03420

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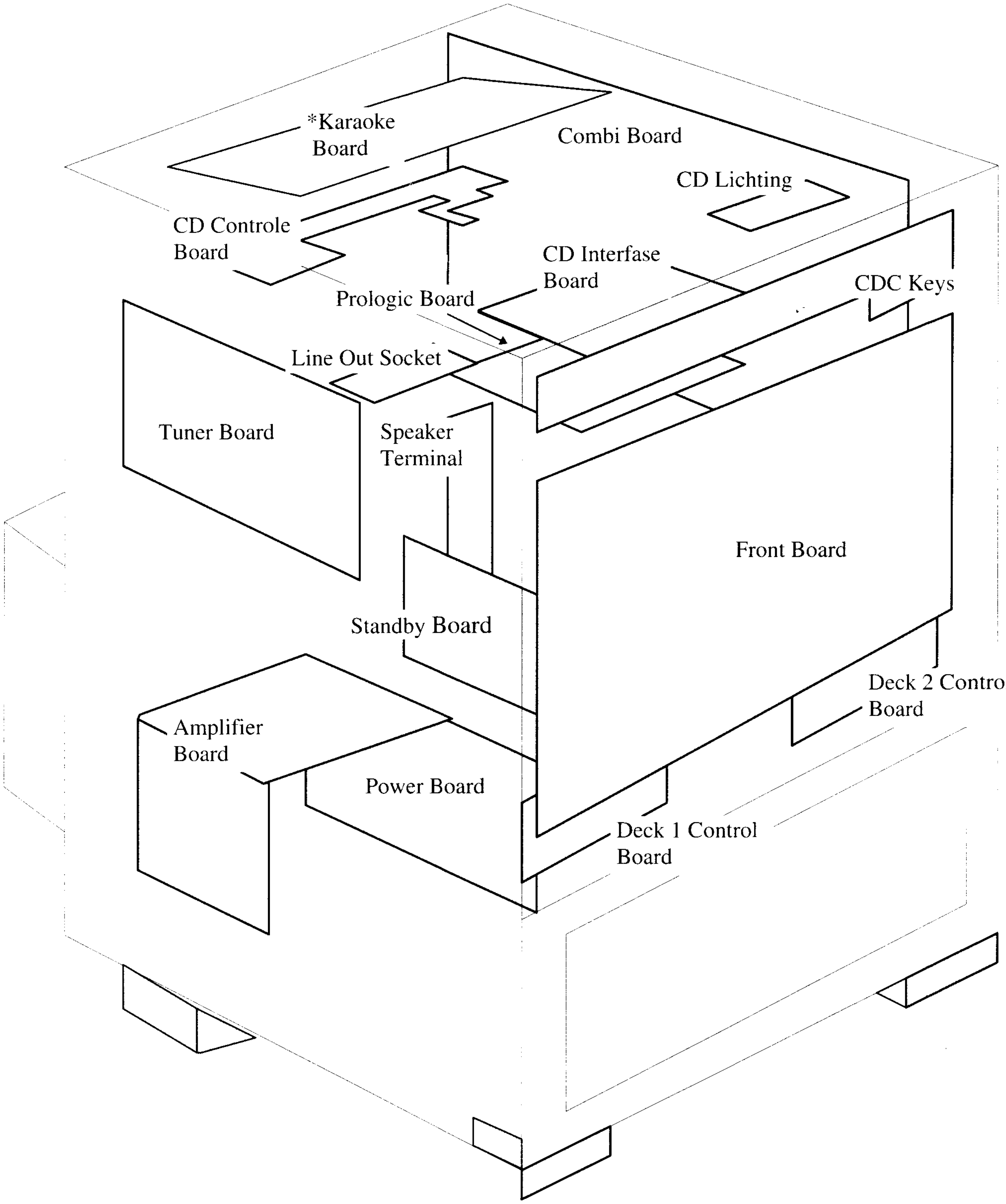
4822 725 23979

PCS 69 550

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


*Karaoke Board
Combi Board
CD Lichting
CD Controle Board
CD Interfase Board
CDC Keys
Prologic Board
Line Out Socket
Tuner Board
Speaker Terminal
Front Board
Standby Board
Deck 2 Control Board
Amplifier Board
Power Board
Deck 1 Control Board

* Karaoke Board not in all versions

TECHNICAL SPECIFICATION

General

Mains voltage : 230V / 50 Hz for /22
: 110-127V / 220-240V switchable for /21

Power consumption : ≤300W at maximum output power
: ≤2W in power off mode
: ≤15W Clock mode - display ON
Clock : Mainsbreak buffer time 10 min.

Amplifier :

Output power L&R : 2 x 50 W D=10%
Center : 25W at 6 Ω D=10%
Surround : 50W at 6 Ω D=10%
Music power L&R : 2 x 110 W at 6 Ω
Center : 60W at 6 Ω
Surround : 110W at 6 Ω
Headphone : 3,5 mm stereo jack 2,75V EMF
Power stage protection : Shortcircuit, AC, DC,
: Temperature
Frequency response : 63 Hz - 20 kHz (-3dB) Limit
Input sensitivity
AUX/LINE : 500mV
Microphone : 2,5mV

Equalizer :

DBB (at 60Hz) :DBB 1 / 2 / 3 +6dB/ +10dB/ +14dB
DSC Optimal :60Hz +3dB 600Hz +1dB 10kHz +1dB
Rock :60Hz +9dB 300Hz - 1dB 10kHz +4dB
Jazz :60Hz +5dB 250Hz - 2dB 10kHz +7dB
Classic :60Hz +7dB 250Hz - 3dB 10kHz +5dB
Incredible Sound

Dolby Pro-logic : pro-logic
: 3 stereo
: center - normal
- phantom

Tuner :

FM
Tuning range : 87,5 - 108 MHz
Grid : 50kHz
Aerial input : 75Ω Coax
: 300Ω Click fit for /37
IF : 10,7MHz ± 25kHz
Sensitivity Mono 26dB S/N : ≤ 3 μV (75Ω)
: ≤ 6 μV (300Ω)
Sensitivity Stereo 46dB S/N : ≤ 61 μV:(75Ω)
: ≤ 123 μV (300Ω)
Sensitivity Search tuning : ≤ 12 μV
Distortion at RF=1mV,Δf=75kHz : ≤ 2%
Channel separation 1kHz : ≥ 26dB (35dB typ.)
Image suppression : ≥ 75dB (100dB typ.)
3 dB limiting point : ≤7 μV (2μV typ.)

MW
Tuning range : 522 - 1611 kHz
: 530 - 1710 kHz for /37
Grid : 9kHz
: 10 kHz for /37
Aerial input : Frame antenna
IF : 450kHz ± 1kHz
Sensitivity : ≤ 2mV/m
Distortion at RF=100mV,m=30% : ≤ 3% (2,5% typ.)
Image rejection ratio : ≥28 dB (33dB typ.)

LW
Tuning range : 153 - 279 kHz
Grid : 3kHz
Aerial input : Frame antenna
IF : 450kHz ± 1kHz
Sensitivity : ≤ 4,5 mV/m
Distortion at RF=100mV, m=30% : ≤ 3% (2,5% typ.)
Image rejection ratio : ≥ 35dB (45dB typ.)

CD unit :

Have to be measured direct on internal connector 1300

Frequency response : 20 - 20.000Hz ± 2dB
Output level : 2V ± 3dB
Signal/noise ratio : 90dB
Distortion : < 1% at 1 kHz
Channel difference : < 2dB at 1kHz
Channel crosstalk : 50dB max.
Deemphasis : 0 or 15/50 μs

Laser
Output power : ≤500μW
Wave length : 780nm ± 20nm

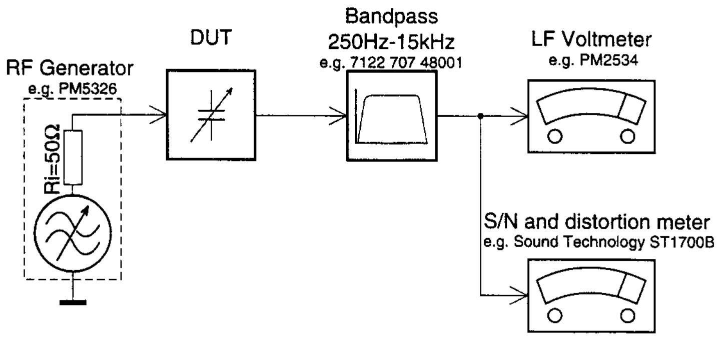
Recorder part :

Tape speed : 4,76cm/s ± 2%
Wow & Flutter : ≤ 0,4 %
Winding speed : ≤ 130s for C60 cassette
Erase / Bias system : AC 80 kHz ± 5kHz
RIF-shift : service solution on request
Distortion at 200 nWb/m : ≤ 3%
Channel difference at PB : ≤ 3dB
Channel difference overall : ≤ 3dB
Channel separation : ≥ 18dB at 1kHz
Track separation : ≥ 55dB at 1kHz
ALC attack time : ≤ 15ms
ALC recovery time : ≥ 50s
Frequency response : 60Hz - 14kHz within 8dB
Signal to Hiss ratio1) : typ 52dB with Fe
: typ 54dB with CrO_2
Signal to Noise ratio2) : typ 47dB with Fe
: typ 47dB with CrO_2
Erase attenuation3) : ≥ 62dB

1) at 250 nW/m A-weighted
2) at 250 nW/m FF-weighted
3) use a 1kHz passfilter to minimize the wide band noise component.

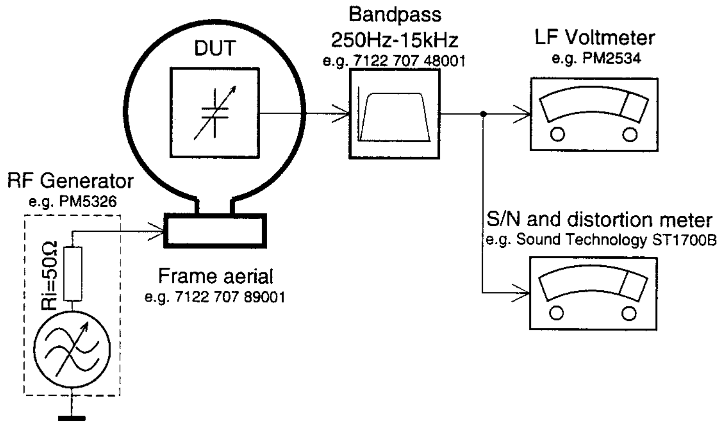
MEASUREMENT SETUP

Tuner FM


RF Generator
e.g. PM5326
Ri=50Ω
DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

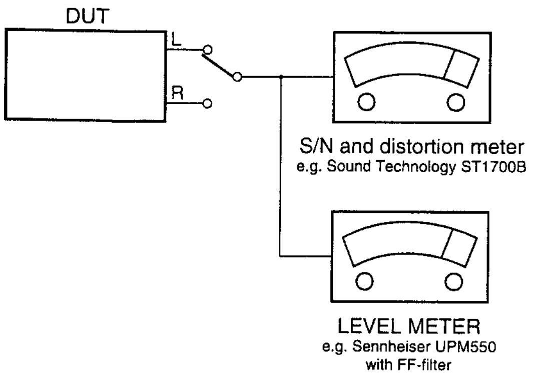
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

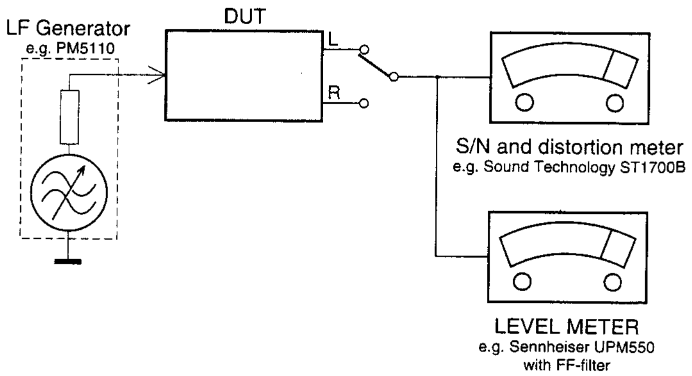
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

RECORDER

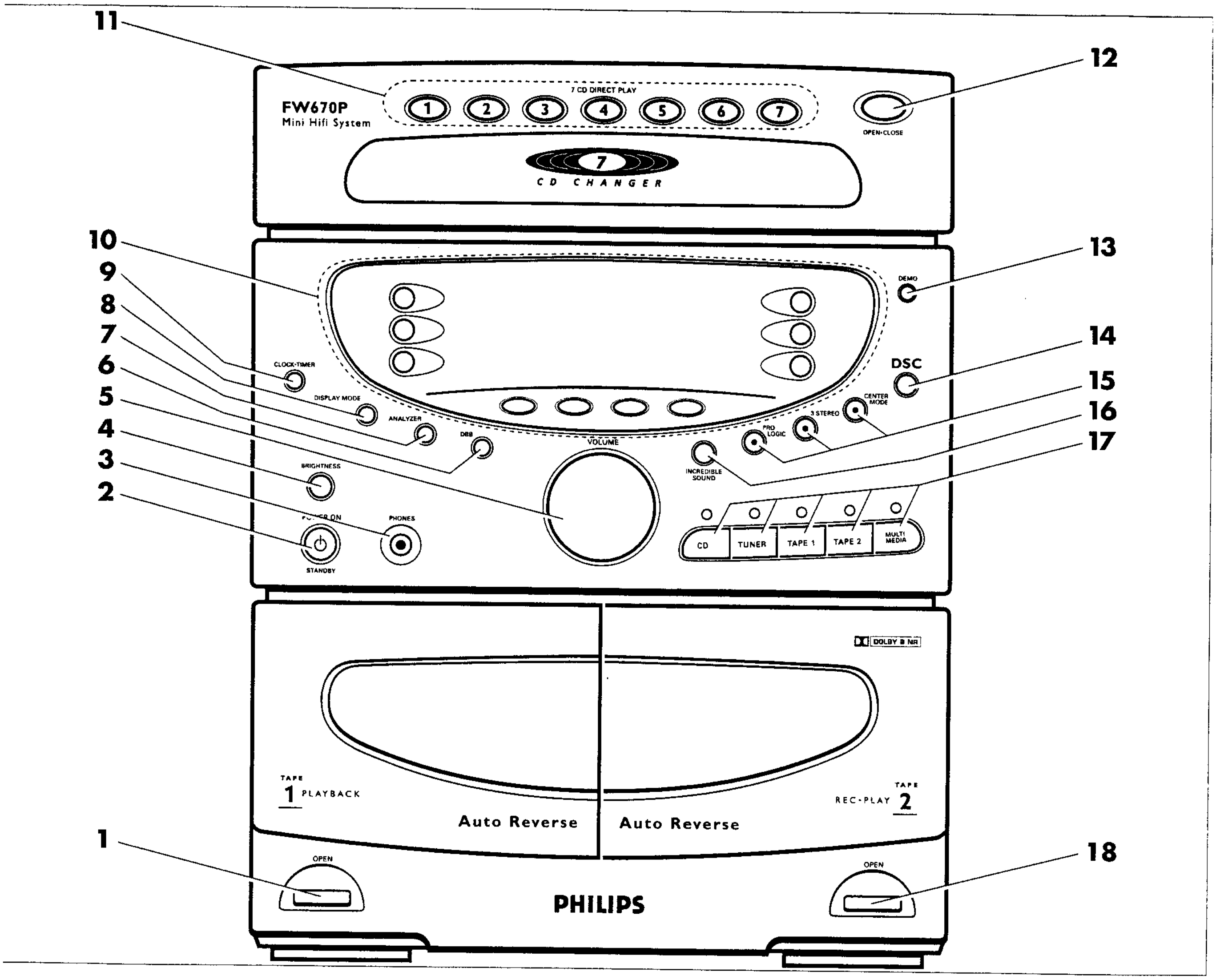
Use Universal Test Cassette **CrO_2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

RC5 SYSTEM/COMMAND CODES

Remote control key	System Code	Command Code
Standby	17, 18, 20	12
Standby pressed longer than 1 sec	00, 05, 21	12
TV	00	63
Presets 10 key	00	00-09
Channel up / down	00	32 / 33
Volume up / down	00	16 / 17
Tuner	17	63
Tuning up / down	17	30 / 31
Preset up / down	17	32 / 33
Preset 10 key	17	00-09
CD	20	63
CD Play	20	53
CD Stop	20	54
CD Pause	20	48
Preset 10 key	20	00-09
CD Next	20	32
CD Previous	20	33
CD Search forward	20	52
CD Search backward	20	50
CD Disc	20	30
Repeat	20	29
Shuffle	20	28
Tape1	18	44
Tape2	18	46
Side	18	47
Tape Play	18	53
Tape Stop	18	54
Tape Wind	18	52
Tape Rewind	18	50
Tape Pause	18	48
Next	18	32
Previous	18	33
VCR	05	63
VCR Play	05	53
VCR Stop	05	54
VCR Wind	05	52
VCR Rewind	05	50
Preset up / down	05	32 / 33
Preset 10 key	05	00-09
Incredible Sound	16	64
DBB	16	70
DSC	16	79
Volume up / down	16	16 / 17
Vocal Fader	16	67
3-stereo	16	02
Prologic	16	01
Center up / down	16	102 / 103
Rear up / down	16	65 / 66
Balance Right	16	26
Balance Left	16	27
Delay	16	104
Install	16	88
Brightness	16	71
Display	16	15
Multi media	21	63

CONTROLS


11
12
FW670P
Mini Hifi System
7 CD DIRECT PLAY
1
2
3
4
5
6
7
OPEN•CLOSE
7
CD CHANGER
10
9
8
7
6
5
4
3
2
13
DEMO
14
DSC
15
CENTER MODE
16
3 STEREO
17
PRO LOGIC
INCREDIBLE SOUND
CLOCK•TIMER
DISPLAY MODE
ANALYZER
DBB
VOLUME
BRIGHTNESS
POWER ON
STANDBY
PHONES
CD
TUNER
TAPE 1
TAPE 2
MULTI MEDIA
DOLBY B NR
TAPE 1 PLAYBACK
Auto Reverse
Auto Reverse
TAPE REC-PLAY 2
1
OPEN
PHILIPS
OPEN
18

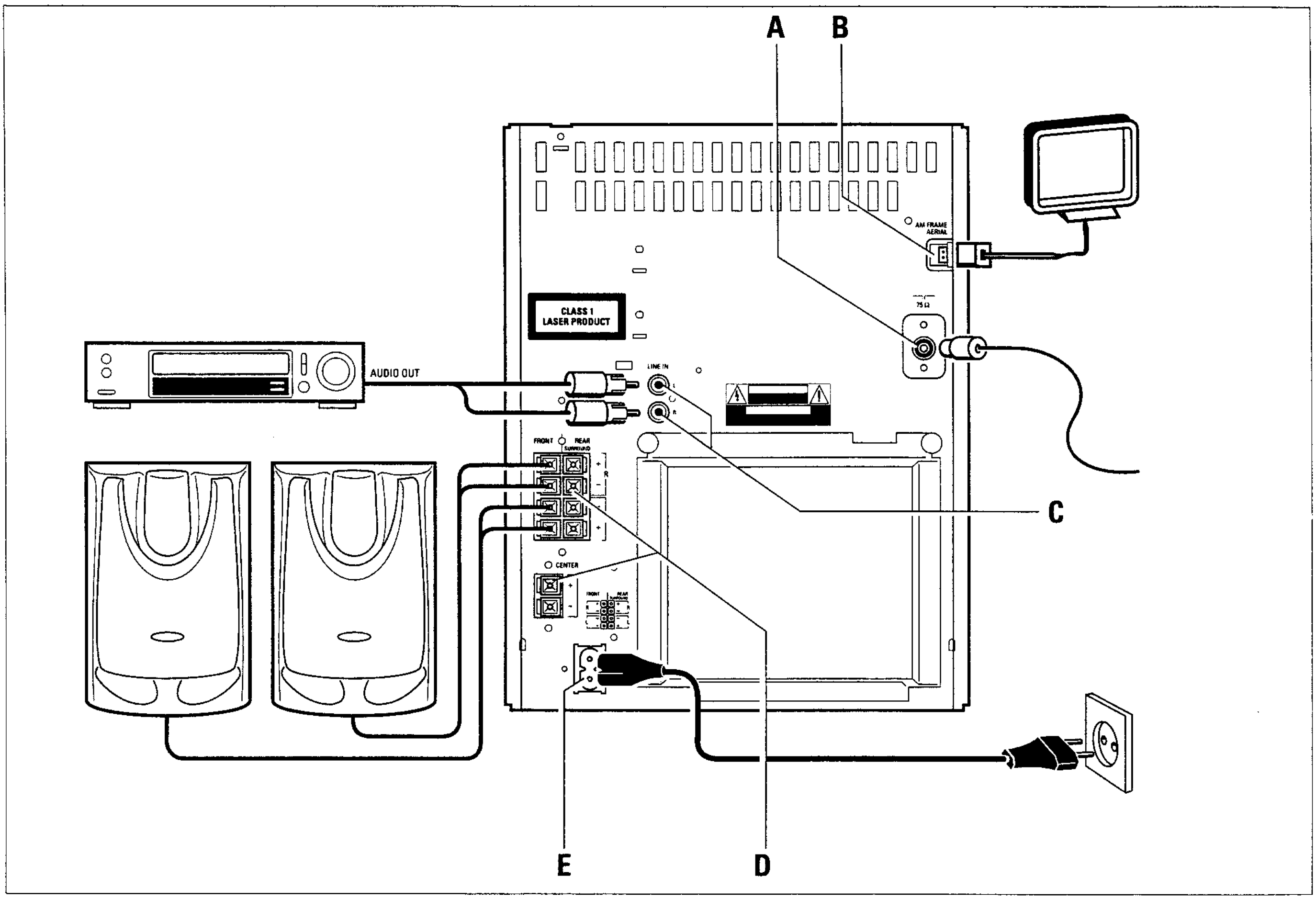
ront panel

	OPEN	to open the cassette compartment of deck 1
	POWER ON/STANDBY	to switch the set on and off
	PHONES	3.5 mm headphones socket *Inserting the plug will disconnect the speakers.*
	BRIGHTNESS	to adjust the intensity of the display illumination
	VOLUME	to adjust the volume level
	DBB	**D**ynamic **B**ass **B**oost: to increase the bass level
	ANALYZER	to switch the spectrum analyzer on and off
	DISPLAY MODE	to change the type of display information for the selected source
	CLOCK·TIMER	to select the clock/timer function
0	**System display and buttons**	
1	**1-7**	to select the desired CD
2	**OPEN·CLOSE**	to open and close the CD tray
3	**DEMO**	to switch on and off the demonstration mode

Digital sound control buttons:

14	**DSC**	**Digital sound control button** to select the desired equalizer setting: OPTIMAL→FLAT→ROCK→JAZZ→CLASSIC→...
15	**PRO LOGIC**	to select the home theater sound
	3 STEREO	to select the 3 speaker stereo sound
	CENTER MODE	to select CENTER NORMAL mode or CENTER PHANTOM mode in PRO LOGIC
16	**INCREDIBLE SOUND**	– to create a spatial stereo effect.
17	**Sound source selection buttons:**	
	CD	to select the CD changer
	TUNER	to select the tuner
	TAPE 1	to select the left tape deck
	TAPE 2	to select the right tape deck
	MULTIMEDIA	to select the multimedia mode (external sources, e.g. TV sound)
18	**OPEN**	to open the cassette compartment of deck 2

INSTALLATION



Before you start ...

- ***For users in the U.K.:*** please follow the instructions on page 2.
- After unpacking the system, remove all protective material.

- ***Before connecting the system to the mains***, check if the mains voltage as shown on the type plate corresponds to your local mains voltage. If it does not, consult your dealer or service organisation.
  If your set is equipped with a voltage selector, set this selector to the local mains voltage.

The typeplate is located at the rear of the system.

- Place the system on a hard surface.
- Do not cover the vents and make sure that you leave sufficient room for ventilation (5 cm around the unit and 10 cm on top).

Connections

***A* 75 Ω** – Socket for a FM antenna, 75 Ohms.
Connect the supplied antenna wire with this socket. Find a position for best reception.
For good FM stereo reception, use an FM outdoor antenna or a connection to your house distribution system.

***B* AM FRAME AERIAL** – Connector for the supplied AM frame antenna.
Connect the plug of the AM frame antenna to this socket and position the frame antenna for optimum reception. Do not place the frame antenna too close to the units, the wires or the boxes, as this may cause unwanted noise.

***C* LINE IN** – Input sockets (Left/Right) for connecting other sound sources (e.g. VCR, TV audio output etc.).

D Terminals for up to five loudspeakers with an impedance of at least 6 ohms (see SPEAKER CONNECTIONS).

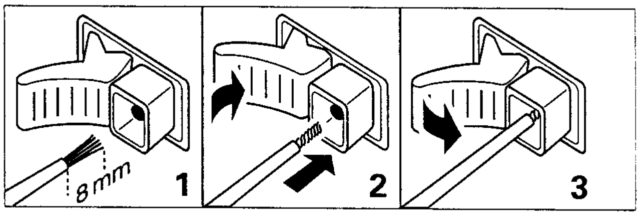
***E* MAINS** – Mains socket. After all other connections have been made, connect the mains lead to the MAINS socket and the wall socket.

Speaker connections

One of the two wires of a loudspeaker cable is marked, e.g. with a olour or rib.

The marked wire should be connected to the red, blue or grey terminal and the unmarked one to the black terminal.

Make sure that the colour combination of wire and terminal is the same for each loudspeaker.



Positioning of the speakers

or positioning of the speakers see drawings below. Placing the peakers on the floor will increase the bass response. Placing the peakers behind curtains, furniture etc. will reduce treble response nd the stereo effect.

You can connect the 2 supplied LSB 670 speakers or you can create a 5-speaker system for surround sound using three extra speakers having a minimum impedance of 6 ohms, e.g. surround-sound speaker system FB 205. See also instruction booklet for speakers FB 205.

2-speaker system

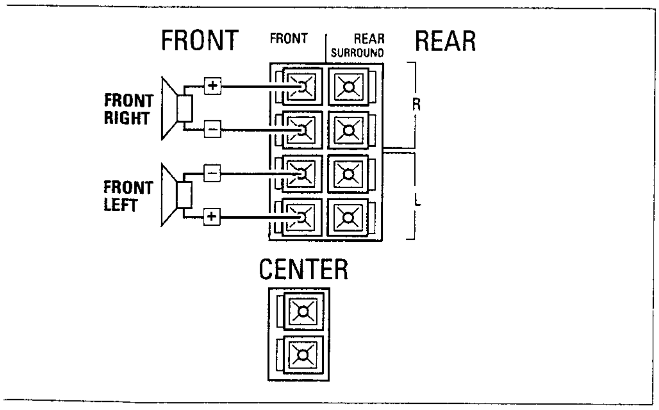
for normal stereo reproduction

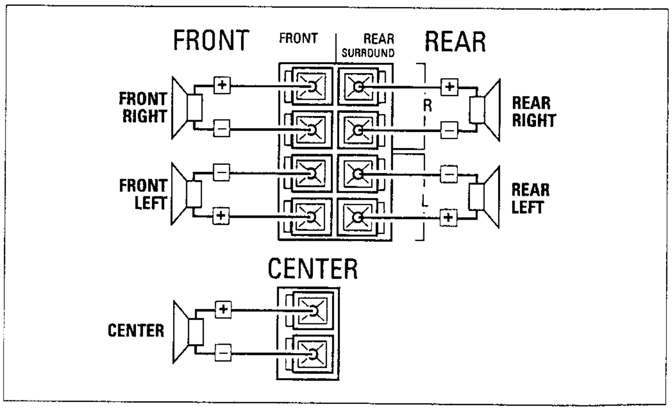
- ***Front left and right speakers:*** Connect the black or non-marked wires to the black terminals and the red or marked wires to the red terminals.

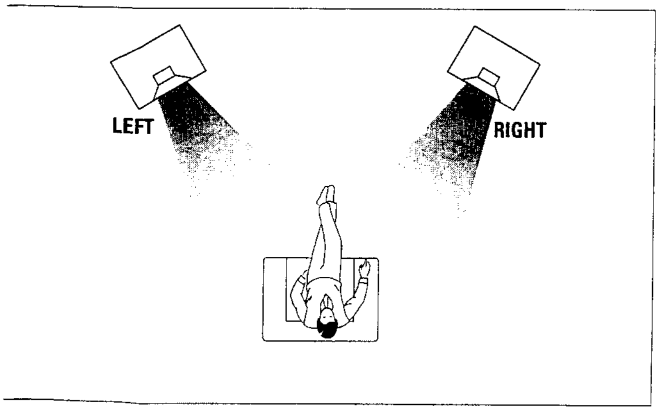
5-speaker system

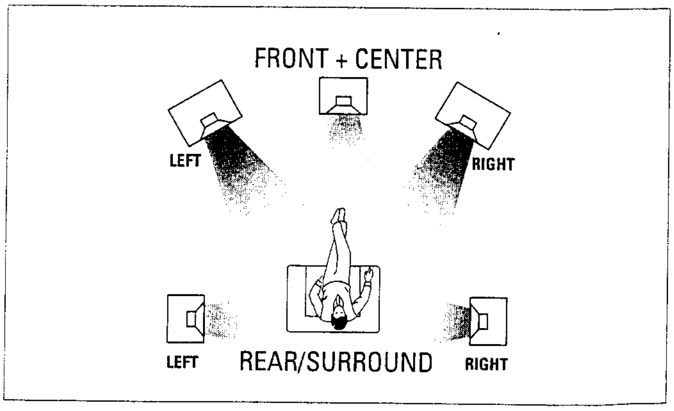
for Dolby Surround Pro Logic reproduction

- ***Front speakers:*** Connect the black or non-marked wires to the black FRONT terminals and the red or marked wires to the red FRONT terminals.
- ***Center speaker:*** Connect the black or non-marked wires to the black CENTER terminal and the blue or marked wires to the blue CENTER terminal.
- ***Rear (surround) speakers:*** Connect the black or non-marked wires to the black REAR terminals and the white or marked wires to the grey REAR terminals.


FRONT
FRONT
REAR SURROUND
REAR
FRONT RIGHT
FRONT LEFT
R
L
+
−
CENTER


FRONT
FRONT
REAR SURROUND
REAR
FRONT RIGHT
FRONT LEFT
REAR RIGHT
REAR LEFT
R
L
+
−
CENTER
CENTER

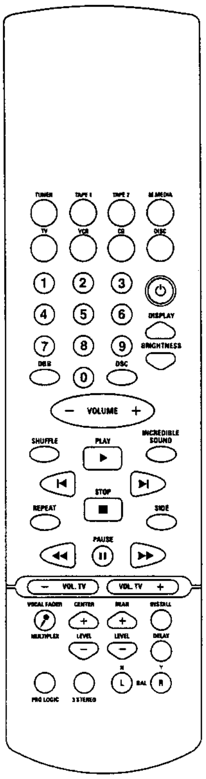



FRONT + CENTER
LEFT
RIGHT
LEFT
REAR/SURROUND
RIGHT

REMOTE CONTROL

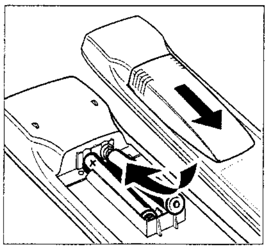
Remote control functions

Always first select the desired sound source and then press the required function key (for example CD + PLAY ▶ or TAPE + PLAY ▶).



Notes:
- *The remote control remains tuned to the selected sound source until another sound source button on the remote control is pressed.*
- *The corresponding LED indicator above the sound source buttons on the system flashes when its source is operated by the remote control.*
- *You can only control TV or VCR if this unit uses the RC-5 remote control system.*
- *Pressing TV or VCR will first switch on the TV set and after 1 sec the whole audio set. If TV or VCR is selected, the STANDBY button will first switch the TV set or VCR to standby and after 1 sec. the whole set.*
- *Pressing TV or VCR for more than 1 sec will select the external source that is connected via the LINE IN sockets.*

Remote control:
- Open the battery compartment and insert the batteries supplied (type R03, UM-4 or AAA) as indicated.
- Remove the batteries if exhausted or if they will not be used again for a long time.

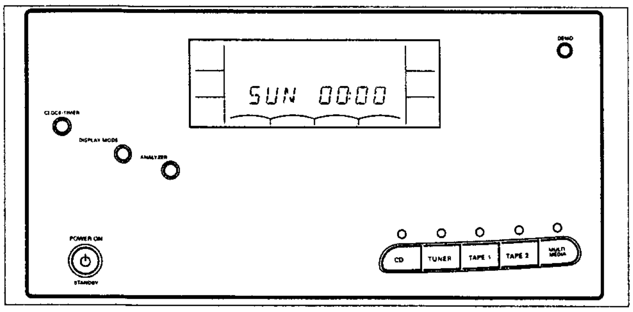


Batteries contain chemical substances, therefore they should be disposed of properly.

TUNER - TAPE 1 - TAPE 2 - M.MEDIA - TV - VCR - CD: sound source selection buttons

DISC	***CD:*** to select a CD (1-7)
Digits 0-9	numbers consisting of two figures must be keyed in within 2 seconds ***CD:*** to key in a track number ***TUNER:*** to key in a preset number ***TV:*** to key in a TV station
STANDBY	to switch the system to the standby mode
DISPLAY	to switch to different display information
BRIGHTNESS	to adjust the intensity of the display
DBB	to increase the bass level
DSC	to select the desired sound setting: OPTIMAL→FLAT→ROCK→JAZZ→CLASSIC→OPTIMAL→...
VOLUME – +	to adjust the volume level of the audio system
SHUFFLE	***CD:*** to to switch on/off the shuffle feature
INCREDIBLE SOUND	to switch on/off this sound feature
PLAY ▶	***CD, TAPE 1 or 2, VCR:*** to start playback
⏮ PREV./NEXT ⏭	***TUNER:*** to select a preset radio station ***CD:*** to select the beginning of the current/ previous or a subsequent track ***TV:*** to select a preset TV station
STOP ■	***CD, TAPE 1 or 2, VCR:*** to stop playback
REPEAT	to play a track or program again
SIDE	***TAPE 1 or 2:*** to select the front or back side of the tape (FRONT/BACK)
◀◀ ▶▶	***TUNER:*** to tune to a radio station ***CD:*** to search for a particular passage ***TAPE 1 or 2, VCR:*** to wind the tape
PAUSE II	***CD, TAPE 1 or 2, VCR:*** to interrupt playback
VOL TV – +	***TV:*** to adjust the volume
VOCAL FADER/ MULTIPLEX ↗	to select between the different options to fade out the vocals for KARAOKE (only works with KARAOKE versions)
CENTER – +	to adjust the volume level of the center speaker
REAR – +	to adjust the volume level of the rear (surround) speakers
INSTALL	to start the programming sequence to adjust the level of the speakers in DOLBY PRO LOGIC and DOLBY 3 STEREO.
DELAY	to adjust the delay time of the rear (surround) speakers
PRO LOGIC and **3 STEREO**	to chose a Dolby Surround Sound mode
BAL L(N) R(Y)	to adjust the balance of the front speakers or to choose steps in INSTALL mode

witching on and off/standby


SUN 0000
CD
TUNER
TAPE 1
TAPE 2

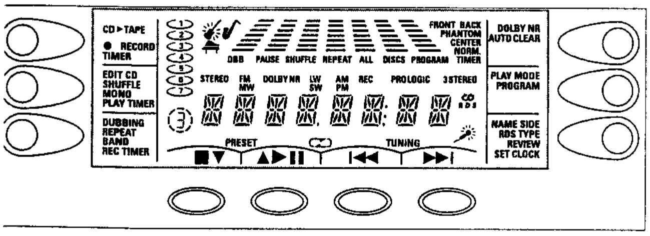
To switch on the unit, press POWER ON/STANDBY on the unit or any sound source button on the unit or on the remote control.
➜The display illumination comes up with full intensity. The selected sound source is indicated on the display and the belonging LED indicator above the sound source button lights up.

To switch off the unit, press POWER ON/STANDBY on the unit or on the remote control.
➜The system is in standby mode. The display illumination is halfdimmed and the display shows the day and time.

To switch off the power supply, remove the mains plug from the wall socket.

Notes:
- *You can also switch on the set by pressing DISPLAY MODE, ANALYZER or DEMO.*
- *The clock memory will be maintained for only ten minutes after the power supply is switched off.*

ystem display and buttons


CD ▸ TAPE
● RECORD
TIMER
EDIT CD
SHUFFLE
MONO
PLAY TIMER
DUBBING
REPEAT
BAND
REC TIMER
1
2
3
4
5
6
7
FRONT BACK
PHANTOM
CENTER
NORM.
TIMER
DBB
PAUSE
SHUFFLE
REPEAT
ALL
DISCS
PROGRAM
STEREO
FM
MW
DOLBY NR
LW
SW
AM
PM
REC
PROLOGIC
3 STEREO
CD
RDS
PRESET
TUNING
■▼
▲▶II
I◀◀
▶▶I
DOLBY NR
AUTO CLEAR
PLAY MODE
PROGRAM
NAME SIDE
RDS TYPE
REVIEW
SET CLOCK

hen you select a sound source or the clock/timer mode, the nctions available for the chosen source or the clock/timer mode ght up in the display.

y using the 10 buttons around the display field, you can select the esired function. These functions are explained in the appropriate hapters in detail.

Adjusting the display illumination

You can change the intensity of the display illumination by pressing BRIGHTNESS.
➜When the system is switched on, the illumination switches from FULL INTENSITY→HALF INTENSITY→OFF→FULL ...
➜In standby mode, the illumination switches from HALF INTENSITY→OFF→HALF ... When the display is off, the power input is reduced to about 1 Watt.

Note: When switching on the system, the display always comes on with full intensity.

ANALYZER – Spectrum Analyzer

The graph bars in the centre of the display show the sound levels. The spectrum analyzer shows continuously the actual frequency distribution of the current sound.

- By pressing the ANALYZER button, the spectrum analyzer bars are either hidden or shown.
  ➜ The display shows either ANALYZER OFF or ANALYZER ON.

Note: When switching on the system, the spectrum analyzer is always switched on.

BALANCE

You can change the balance setting for your speakers to increase your individual listening pleasure.

1 Press BAL L or BAL R on the remote control.
➜The display shows respectively BAL L or BAL R.
➜If the display shows BAL L-R the sound is balanced.

2 Press BAL L or BAL R again to change the current setting.

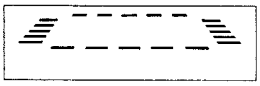
Note: If you do not press a button for 4 seconds you will have to start over.

SOUND CONTROLS

INCREDIBLE SOUND

Press INCREDIBLE SOUND in addition to other sound settings to activate the incredible sound feature. This creates a phenomenal stereo surround sound effect even if the speakers are positioned close to the system.The sound becomes "incredibly" spatial.

→ The button lights up when the incredible sound feature is switched on.



Note: Pressing INCREDIBLE SOUND will switch off the PRO LOGIC or the 3 STEREO mode if active at that time.

DBB – Dynamic Bass Boost

The bass response can be enhanced in 4 steps: every time you press the DBB button, the bass is enhanced even stronger or the DBB feature is switched off.

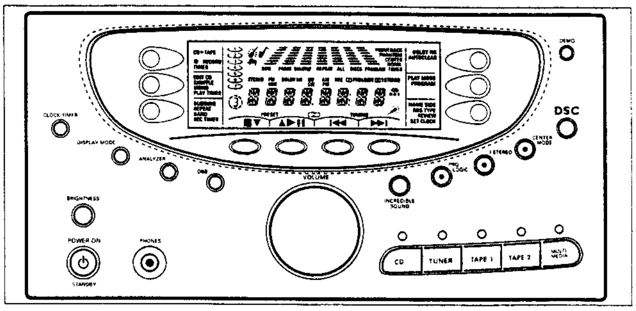
→ The display shows the selected DBB level:
DBB 1→DBB 2→DBB 3→DBB OFF→DBB 1→...

DSC – Digital sound control

Press DSC repeatedly to switch to OPTIMAL, FLAT, ROCK, JAZZ, or CLASSIC to enhance the type of music you are listening to.

→ In the display the belonging icon lights up. A realistic atmosphere for the selected style of music is created.

DOLBY PRO LOGIC



Dolby Surround Pro Logic sound is your entrance into the world of home theater entertainment. Audio- and video tapes and discs (Video Tapes, Video-CDs, LDs,...) with the Dolby Surround mark DD DOLBY SURROUND are encoded for multi channel surround sound. The sound setting DOLBY PRO LOGIC allows you to listen to soundtracks as they were recorded through the left, right, center, and rear channels.
Most ordinary stereo tapes and discs can be replayd using the Dolby surround sound settings with good results. If the reproduction should be distorted in DOLBY PRO LOGIC mode switch to 3 STEREO or to normal stereo mode.

The external source for Dolby Pro Logic reproduction has to be a stereo appliance. Always use the fixed-level output socket on the external source for connecting it to the stereo system.

This set is preprogrammed to provide you with the optimal Dolby Surround Pro Logic sound experience.

Connecting 5 speakers to this stereo system will get you optimal results in DOLBY PRO LOGIC mode. For reproduction through FRONT- and REAR (SURROUND) speakers switch to CENTER PHANTOM mode in addition to the DOLBY PRO LOGIC sound setting.The 3 STEREO mode is intended for use with 2 FRONT speakers and a CENTER speaker.

You can further optimize the sound reproduction for your room. Adjust the volume levels, balance and time delay with the remote control according to your indvidual taste.

Notes:
- *PRO LOGIC or 3 STEREO can be combined with DBB and DSC.*
- *If you connect Headphones or a microphone PRO LOGIC or 3 STEREO is switched off automatically.*
- *If you press INCREDIBLE SOUND, PRO LOGIC or 3 STEREO is switched off automatically.*

DOLBY SURROUND PRO LOGIC

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DOLBY PRO LOGIC

DOLBY PRO LOGIC

This setting is intended for sound reproduction through 5 speakers.

- Press PRO LOGIC
  →PRO LOGIC lights up in the display and PRO LOGIC ON is scrolled once.

Note: Do not attach headphones or a microphone or press INCREDIBLE SOUND or VOCAL FADER as this will terminate DOLBY PRO LOGIC.

CENTER PHANTOM for 4 speakers

The CENTER NORMAL mode is the standard setting for reproduction throuh 5 or 3 speakers. The CENTER PHANTOM mode improves the sound reproduction if there are only front and rear (surround) speakers connected to the set. The information intended for the center speaker is split up between the front speakers.

1 Press CENTER MODE
→CENTER NORMAL lights up in the display and CENTER NORMAL is scrolled once.

2 Press CENTER MODE again
→CENTER PHANTOM lights up in the display and CENTER PHANTOM is scrolled once.

3 Press CENTER MODE again to switch back to CENTER NORMAL.

Note: This setting cannot be changed by remote control.

DOLBY 3 STEREO

This setting is intended for sound reproduction through the front speakers and a center speaker.

- Press 3 STEREO
  →3 STEREO lights up in the display and 3 STEREO ON is scrolled once.

Note: Do not attach headphones or a microphone or press INCREDIBLE SOUND or VOCAL FADER as this will terminate DOLBY 3 STEREO.

CENTER LEVEL

1 Press CENTER + or CENTER – on the remote control to set the level of the center speaker.
→The display shows, e.g. CENT+6 for 4 seconds.

2 Press CENTER + or CENTER – again to change the current setting.

Note: If you do not press a button for 4 seconds you will have to start over.

REAR LEVEL

1 Press REAR + or REAR – on the remote control to set the level of the rear (surround) speakers.
→The display shows, e.g. REAR+5 for 4 seconds.

2 Press REAR + or REAR – again to change the current setting.

Note: If you do not press a button for 4 seconds you will have to start over.

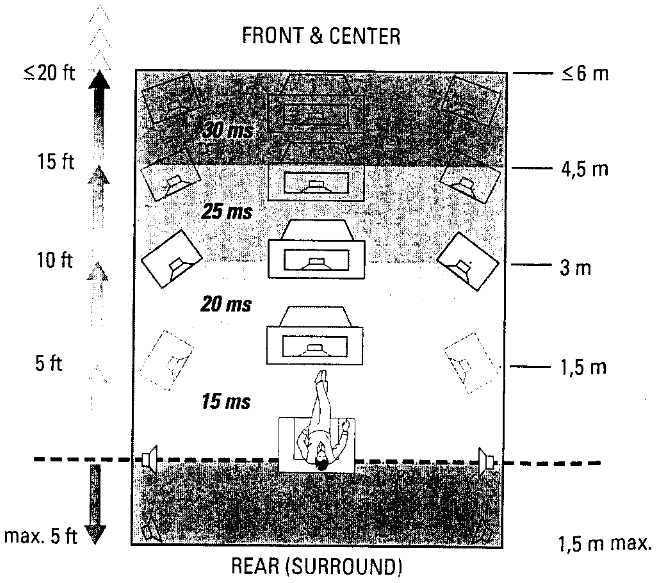
DELAY

Setting the delay time for the rear (surround) speakers according to the positioning of the loudspeakers and your sitting position will ensure the optimal sound reproduction (see drawing below).

1 Press DELAY on the remote control to set the delay time of the rear (surround) speakers.
→The display shows, e.g. DEL 20 MS for 4 seconds.

2 Press the DELAY button again to change the current setting in steps of 5 mS.

Notes:
- *In most cases a delay time of 20 mS is sufficient.*
- *If you press DELAY again after the maximum setting 30 mS the delay time is decreased to the minimum setting 15 mS.*
- *If you do not press a button for 4 seconds you will have to start over.*



INSTALL FOR DOLBY PRO LOGIC MODES

The INSTALL mode is an interactive sequence of programming steps. You can adjust the balance setting of the front speakers, the sound levels of all speakers and the delay time of the rear (surround) speakers. This is done with the remote control in one continuous routine.

Notes:

- *You can leave the INSTALL mode at any step by pressing on a source button (e.g.: TAPE, CD, STANDBY).*
- *If you do not press a button for 4 seconds you will have to start over.*
- *During INSTALL mode use the BAL L and the BAL R buttons for N(o) and Y(es) decisions in the sequence.*
- *The INSTALL mode cannot be activated when there are headphones or a microphone attached to the set.*

DOLBY PRO LOGIC

Installation for 5 speakers

Press INSTALL
ADJUST BALANCE AND PRESS INSTALL IF OPTIMAL is scrolled and a testtone starts up.

Press BAL L or BAL R to set balance
The bars in the equalizer part change according to your setting.

Press INSTALL when the setting is optimal.
CENTER SPEAKER Y/N is scrolled.

Press Y (= BAL R button on the remote control) to adjust the level of the center speaker.
CENTER NORMAL is scrolled once.
ADJUST CENTER AND PRESS INSTALL IF OPTIMAL is scrolled. A testtone starts up.

Press CENTER+ or the CENTER – button to set the level of the center speaker.
Display indication is, e.g. CENT+4 for 4 seconds.

Press INSTALL when the setting is optimal.
REAR SPEAKERS Y/N is scrolled.

Press Y (= BAL R button on the remote control) to set the level of the rear (surround) speakers.
ADJUST REAR AND PRESS INSTALL IF OPTIMAL is scrolled. A testtone starts up.

Press REAR+ or REAR – button to set the level of the rear (surround) speakers.
Display indication is, e.g. REAR+4.

Press INSTALL when the setting is optimal.
SET DELAY AND PRESS INSTALL IF OPTIMAL is scrolled.

Press the DELAY button to set the delay time of the rear (surround) speakers.
Display indication is, e.g. DEL 20MS.

Press INSTALL when the setting is optimal.
PRO LOGIC INSTALLED is scrolled once.

Installation for 4 speakers

Note: The set switches to CENTER PHANTOM mode automatically.

Press INSTALL
ADJUST BALANCE AND PRESS INSTALL IF OPTIMAL is scrolled and a testtone starts up.

Press BAL L or BAL R to set balance
The bars in the equalizer part change according to your setting.

Press INSTALL when the setting is optimal.
CENTER SPEAKER Y/N is scrolled.

Press N (= BAL L button on the remote control)
REAR SPEAKERS Y/N is scrolled.

Press Y (= BAL R button on the remote control)
CENTER PHANTOM is scrolled once.
ADJUST REAR AND PRESS INSTALL IF OPTIMAL is scrolled. A testtone starts up.

Press REAR+ or REAR – button to set the level of the rear (surround) speakers.
Display indication is, e.g. REAR+4.

Press INSTALL when the setting is optimal.
SET DELAY AND PRESS INSTALL IF OPTIMAL is scrolled.

Press the DELAY button to set the delay time of the rear (surround) speakers.
Display indication is, e.g. DEL 20MS.

Press INSTALL when the setting is optimal.
PRO LOGIC INSTALLED is scrolled once.

INSTALL FOR DOLBY PRO LOGIC MODES

DOLBY 3 STEREO

Installation for 3 speakers

Press INSTALL

ADJUST BALANCE AND PRESS INSTALL IF OPTIMAL is scrolled and a testtone starts up.

Press BAL L or BAL R to set balance

The bars in the equalizer part change according to your setting.

Press INSTALL when the setting is optimal.

CENTER SPEAKER Y/N is scrolled.

Press Y (= BAL R button on the remote control) to adjust the level of the center speaker.

CENTER NORMAL is scrolled once.
ADJUST CENTER AND PRESS INSTALL IF OPTIMAL is scrolled. A testtone starts up.

Press CENTER+ or the CENTER – button to set the level of the center speaker.

Display indication is, e.g. CENT+4 for 4 seconds.

Press INSTALL when the setting is optimal.

REAR SPEAKERS Y/N is scrolled.

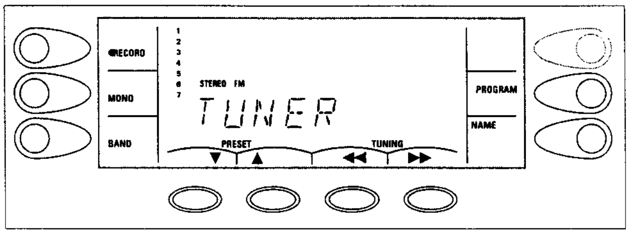
Press N (= BAL L button on the remote control)

3 STEREO INSTALLED is scrolled once.

TUNER

Tuning to radio stations

1 Press TUNER on the unit or on the remote control.
→ First TUNER appears on the display and after a few seconds it will show the current frequency or the station name if available.The available display button functions light up:



2 Select the desired waveband by repeatedly pressing BAND.

3 Hold down TUNING ◀◀ or ▶▶ (◀◀ or ▶▶ on the remote control) until you approach the required frequency.
→ As long as the button is pressed, the digits on the display change according to the frequency.
→ As soon as you release the button, SEARCH appears on the display and the tuner searches the next station of sufficient strength. If the frequency has already been stored, the preset number is also displayed.

4 Press MONO to switch over to mono reception if there is interference noise caused by poor FM stereo reception.
→ Briefly MONO is displayed and the icon STEREO disappears.
→ When you switch back to stereo reception, the display will briefly show STEREO.

5 Repeat this procedure until you find the desired station.

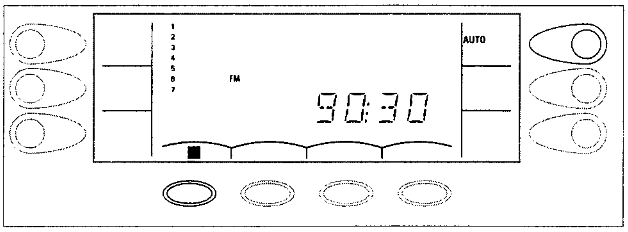
Note: If you briefly press TUNING ◀◀ or ▶▶ (◀◀ or ▶▶ on the remote control), the frequency changes step by step.

Programming radio stations (preset stations)

Automatic programming

30 radio stations can be stored automatically in the memory. This function will clear the old preset numbers. If less than 30 radio stations are found, the remaining preset numbers will not be changed.

1 Press TUNER on the unit or on the remote control.
2 Press PROGRAM to enter the programming mode.
3 Select the waveband by repeatedly pressing BAND.
4 Press AUTO to start the automatic programming.
→ The available display button functions light up and AUTO starts flashing:



→ The tuner automatically tunes to stations in the selected waveband. If less than 30 stations of sufficient strength are found, the tuner will stop.
→ The last newly stored preset number is automatically tuned in.

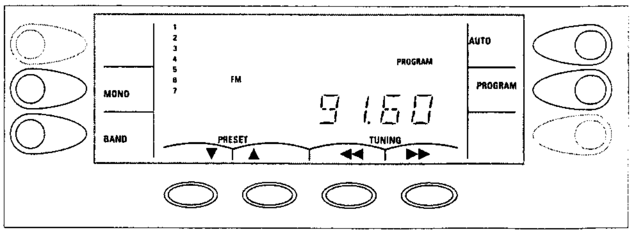
- To stop the automatic programming, press AUTO or ■.

Notes:
- If you want to maintain some old presets, for example preset 1-9, select preset 10 ***before starting automatic programming:*** *now only the presets 10 up to 30 will be programmed.*
- When scanning the FM-band, the tuner first searches for RDS stations. After that, the FM-band is scanned again for other stations.

Manual programming

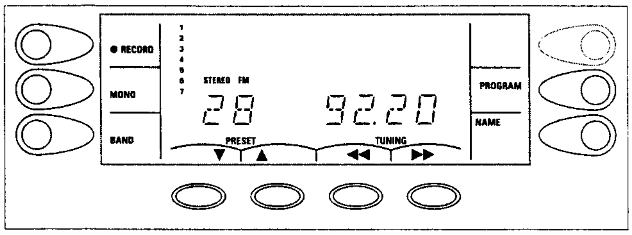
You can store up till 30 radio stations in the memory.

1 Press TUNER on the unit or on the remote control.
2 Press PROGRAM to enter the programming mode.
→ The available display button functions light up and PROGRAM starts flashing:



3 Select the desired waveband by repeatedly pressing BAND.
4 Tune to the station to be programmed with TUNING ◀◀ or ▶▶ (or ◀◀ or ▶▶ on the remote control), as described earlier.
5 If desired, switch over to FM mono reception by pressing MONO.
6 Press PRESET ▲ or ▼ to allocate a number from 1 to 30 to the preset station (on the remote control use the buttons |◀ or ▶| or 0-9).
7 Press PROGRAM to confirm the setting.
→ The frequency, preset number and stereo setting are now entered in the memory.

Selecting a preset station



- Press PRESET ▲ or ▼ until the desired preset number appears on the display (on the remote control use the buttons ⏮ or ⏭ or 0-9).

RECORD ●

1 As soon as you press RECORD ●, the current sound will be recorded on TAPE 2, provided a tape suitable for recording is loaded.

2 To stop recording, press ■ (or STOP ■ on the remote control).

Switchable LW waveband *(not on all versions)*

Some countries do not have a LW waveband. In some versions it is possible to delete (include) the LW waveband from the BAND menu.

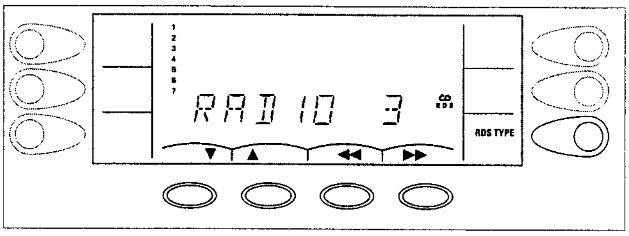
- Keep the sound source button TUNER pressed for more than ***5 sec.***
  → The display shows either LW OFF or LW ON.

Receiving RDS radio stations

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

-**STATION NAME:** The station name is displayed instead of the frequency.
-**PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
-**RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo and the station name will appear on the display:



- The display normally shows the radio station name if available.
  By repeatedly pressing DISPLAY MODE you can change the type of display information:
  → The display shows in turn: STATION NAME→FREQUENCY→ PROGRAM TYPE→RADIO TEXT→STATION NAME...

Selecting the PROGRAM TYPE

1 You can scan through the FM band for an RDS station that currently broadcasts a specific type of program: press RDS TYPE.
→ The available display button functions light up and RDS TYPE starts flashing.

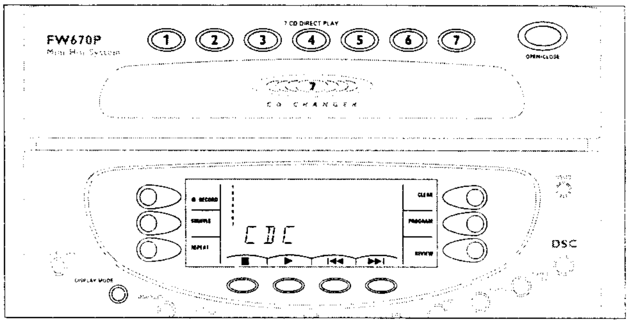
2 Press ▲ or ▼ until the desired program type appears on the display.

3 Press ◀◀ or ▶▶ to start searching for an RDS station that broadcasts the desired program type.
→ A suitable RDS station is tuned in. Or, if the program type is currently not broadcast, the display shows NOT FOUND.

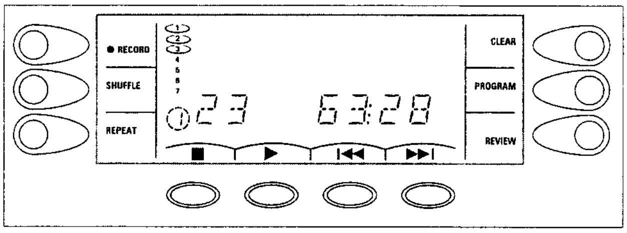
CD CHANGER

Inserting the CDs

1 Press CD on the unit or on the remote control.
→ Briefly CDC appears on the display. If there is no CD in the CD tray, the display will show NO DISC.
The available display button functions light up:



2 Press OPEN·CLOSE or a digit button 1 - 7 on the unit to open the CD tray.
→ The display shows OPEN.
3 Insert a CD, printed side up.
4 Close the tray by pressing OPEN·CLOSE.
→ The display shows READING and thereafter the total number of tracks and the total playing time. An oval around the tray number (1-7) indicates when a tray is loaded.



5 To load another CD, press the desired digit button 1 - 7 (or DISC on the remote control).
→ The CD tray opens automatically when there is no CD inserted.

Notes:
- Do not load more than one CD into the same tray.
- The tray will also close if you press ▶, any digit button 1 - 7 or SHUFFLE or gently push against the CD tray.

Playing a CD

1 Press ▶ (or PLAY ▶ on the remote control) to start playback of the entire CD.
→ Playback starts with the first track of the selected CD. The display shows the current track number and its elapsed playing time. The playing CD is indicated by a rotating red circle.
→ When all the tracks of all CDs have been played, the CD player stops and the total number of tracks and total playing time of the last played CD are shown on the display.
2 To stop CD play, press ■ (or STOP ■ on the remote control)

- If you want to select the CD to start playback with, press the desired digit button 1 - 7 (or DISC on the remote control).
→ Playback starts automatically if the selected tray is loaded.

- You can interrupt CD play by pressing II on the unit (or PAUSE II on the remote control). Continue CD play by pressing ▶ (or PLAY ▶ on the remote control).

- During play, the display normally shows the elapsed playing time of the track currently played. You can change the type of the time information, by repeatedly pressing DISPLAY MODE on the unit:
→ The display shows in turn: REMAINING TIME OF CURRENT TRACK→ REMAINING TIME OF CD→ELAPSED TIME OF CURRENT TRACK→...

Notes:
- You can also start CD play by selecting a track with the buttons 0-9 on the remote control.
- CD play also stops if you press OPEN·CLOSE or select another sound source.
- The system will switch off automatically, if no button is pressed for more than 15 minutes after CD play has finished.

Selecting another track

- Briefly press ⏮ or ⏭ once/several times to skip to the beginning of the current/previous or subsequent track (on the remote control use the buttons |◀ or ▶| or 0-9).
→ The display shows the selected track number.
→ During play: CD play continues automatically with the selected track.
→ In the stop position: press ▶ to start CD play.

Searching for a passage during CD play

1 Hold down ⏮ or ⏭ (or ◀◀ or ▶▶ on the remote control) to find a particular passage in the forward or backward direction.
→ The volume is automatically reduced to a low level.
2 Release the button when you have reached the desired passage.

Note: In the shuffle mode and when playing a program, searching is only possible within the playing track.

Selecting another source during CD play

- You can select another sound source during CD play. If you select the CD source again, the CD player will return to the original mode: PLAY, SHUFFLE, REPEAT or PROGRAM.
→ CD play will resume at the position where it was interrupted.

Note: CD play cannot be resumed if the unit has been switched to standby in the meantime.

RECORD ●

1 As soon as you press RECORD ●, the current CD-sound will be recorded on TAPE 2, provided a tape suitable for recording is loaded.
2 To stop recording and CD play, press ■ (or STOP ■ on the remote control). If you only want to stop recording, press TAPE 2 first, and then press ■.

REPEAT – repeating a track, a CD or all CDs

1 Press REPEAT on the unit several times until the desired option is displayed:
REPEAT: The current track is played repeatedly.
REPEAT ALL: The entire CD (or program) is played repeatedly.
REPEAT ALL DISCS: All loaded CDs are played repeatedly.

→ During play: The selected repeating mode is automatically executed.
→ In the stop position: press ▶ to start CD play.

2 To return to normal CD play, press REPEAT until all related indications (REPEAT ALL DISCS) disappear from the display.

SHUFFLE – playing in random order

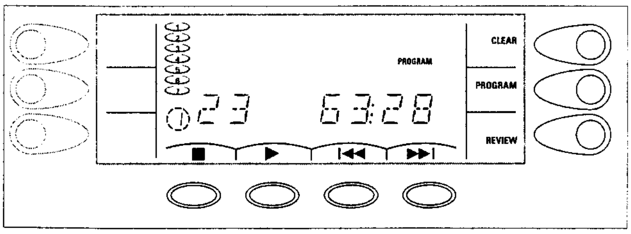
1 Press SHUFFLE on the unit (or on the remote control) several times until the desired option is displayed:
SHUFFLE: All tracks of the current CD are played in random order.
SHUFFLE ALL DISCS: All tracks of all loaded CDs are played in random order.
→ The selected shuffle mode is automatically executed.
2 To return to normal CD play, press SHUFFLE on the unit (or on the remote control).

Note: You can combine some of the REPEAT and SHUFFLE features at the same time and for example repeatedly play the entire CD or program in random order (SHUFFLE REPEAT ALL).

Programming track numbers

You may select a number of tracks and store these in the memory in the desired sequence. You may store any track more than once. At most, 40 tracks can be stored in the memory. The display will show the message PROGRAM FULL, if you exceed the maximum of 40 tracks.

1 Press PROGRAM to enter the CD programming mode.
→ The available display button functions light up and PROGRAM starts flashing:

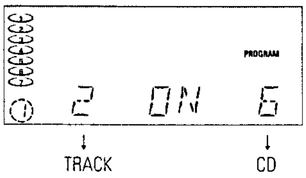


2 Select the desired CD by pressing the appropriate digit button 1 - 7 (or DISC on the remote control).
3 Select the desired track by pressing with ⏮ or ⏭ (or ⏮ or ⏭ or 0-9 on the remote control).
4 As soon as the desired track is displayed, press PROGRAM to store the track.
→ The display shows the total number of stored tracks, followed by the just stored track number. PROG behind the track number indicates, this track number is stored.
5 Select and store in this way all desired tracks.
6 Quit the CD programming mode by pressing ■ (or STOP ■ on the remote control) or
immediately start playback of the program by pressing ▶ or SHUFFLE (or PLAY ▶ or SHUFFLE on the remote control).

Note:
You can also program a sequence of tracks while playing a CD.

Reviewing your settings

- You can review your settings by pressing REVIEW.
→ The display shows in sequence all stored track numbers and the corresponding CD.During CD play only the tracks that still have to be played are shown on the display.



Note: If you press REVIEW when no program is available, the message NO PROGRAM will appear on the display.

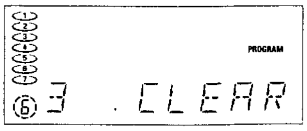
Clearing the entire program (in the stop position)

- Press CLEAR to clear the program.
→ On the display PROGRAM CLEARED briefly lights up and the flag PROGRAM disappears.

Note: The program will also be cleared if you interrupt the power supply.

Clearing a track from a program

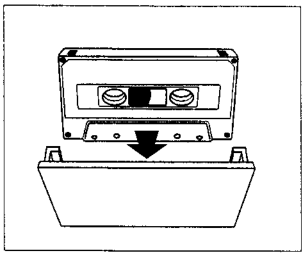
1 Press PROGRAM to enter the CD programming mode.
2 Select the track to be cleared by pressing ⏮ or ⏭ (⏮ or ⏭ on the remote control).
3 As soon as the number you wish to clear is displayed, press CLEAR.
→ The cleared track number and CLEAR appear briefly.



Notes:
- *You will clear all tracks of one specific CD by opening the CD tray when this CD is loaded.*
- *You can also clear one particular track number during the program review: the currently displayed track number will be cleared when you press CLEAR.*

TAPE DECKS

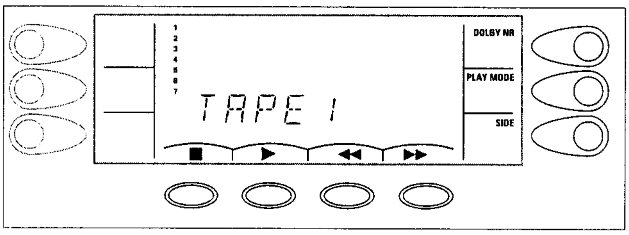
Inserting a tape



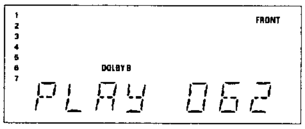
1 Press OPEN to open the cassette compartment.
2 Insert the tape with the open side down.
→ The display shows 000.
→ The deck detects the presence of a tape in the cassette compartment and automatically selects the tape type (NORMAL or CrO_2).

Playing a tape

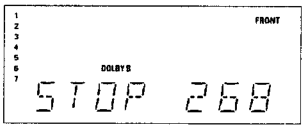
1 Press TAPE 1 or TAPE 2 on the unit or on the remote control.
→ Briefly TAPE 1 or TAPE 2 appears on the display. The available display button functions light up:



2 Insert a recorded tape with the open side down.
3 Select the tape side by pressing SIDE on the unit (or on the remote control) several times until the desired indicator lights up:
→ FRONT: the visible side will be played.
BACK: the invisible backside will be played.
→ The tape counter is set to 000.
4 If desired, switch on the Dolby NR system by pressing DOLBY NR.



5 Press ▶ (or PLAY ▶ on the remote control) to start playback.
→ The display shows the tape counter.



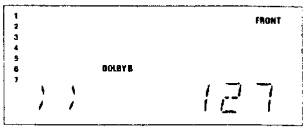
6 Press ■ (or STOP ■ on the remote control) if you want to stop playback before the end of the tape.

Notes:
- You can set the tape counter to 000 by pressing SIDE twice.

- If no button is pressed for more than 15 minutes after playback has finished, the system automatically switches off.

Fast winding

During playback



1 Hold down ◀◀ or ▶▶ (or ◀◀ or ▶▶ on the remote control) to find a particular passage in the forward or backward direction.
→ The volume is automatically reduced to a low level.
2 Release the button when you have reached the desired passage.

In the stop position

1 Briefly press ◀◀ or ▶▶ (or ◀◀ or ▶▶ on the remote control).
2 Stop winding by pressing ■ (or STOP ■ on the remote control).

Play mode

- You can select the playback mode by pressing PLAY MODE several times until the desired indicator lights up:

⊐	to play (record) one side. At the end of the first side the recorder stops.
⊃	to play (record) both sides once. At the end of the first side, the tape direction is reversed and the recorder stops at the end of the second side.
⊂⊃	for non-stop playback. The deck reverses the tape direction (up to ten times) whenever reaching the end of the tape side. To stop, press ■.
1⊂⊃2	for non-stop playback on both decks: The deck reverses the tape direction (up to ten times on each deck) when reaching the end of the tape side. Playback of both tape sides rotates between deck 1 and deck 2. To stop, press ■.

Note: For a recording only the play modes ⊐ and ⊃ are available.

Dolby B Noise Reduction System

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- Switch the Dolby B NR on and off with the DOLBY NR button.

Notes:
- A tape recorded with the Dolby B NR system should also be played in the Dolby B NR mode. If you forget to operate the DOLBY NR button, the treble may be reproduced too strongly or too faintly.

- The Dolby NR button has no influence during dubbing (copying from TAPE 1 to TAPE 2). An original tape recorded with Dolby B NR automatically produces a copy with Dolby B NR.

General information on recording

- Recording is permissible insofar as copyright or other rights of third parties are not infringed.

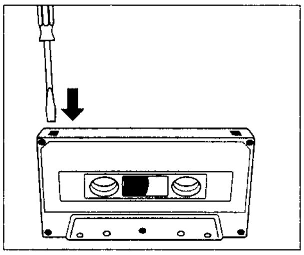
- At the very beginning and end of the tape, no recording will take place during the 7 seconds when the leader tape passes the recorder heads.

- When a recording is active, most functions are disabled. RECORDING ACTIVE will appear on the display when a wrong button is pressed.

- In general, the recording level is set automatically. The recording is not affected by the controls VOLUME, DBB, INCREDIBLE SOUND, ROCK, CLASSIC, JAZZ and OPTIMAL-USER.

Protecting tapes against accidental erasure

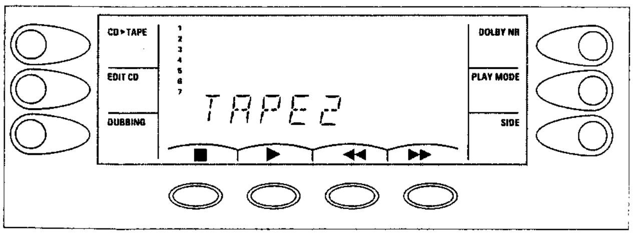
- Keep the tape side to be safeguarded in front of you and break out the left tab. Now, recording on this side is no longer possible.
- To render this safeguard ineffective, cover the aperture with a piece of adhesive tape.



Recording from a CD

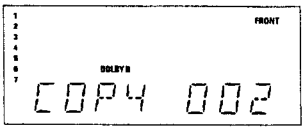
1 Insert a CD and, if desired, program track numbers.

2 Press TAPE 2 on the unit or on the remote control.
→ The available display button functions light up:



3 Insert a blank tape into TAPE 2.
4 Select the tape side by pressing SIDE: FRONT or BACK.
5 Select the play mode by pressing PLAY MODE until the desired indicator lights up: ⌶ or ⊐.
6 If desired, switch on the Dolby NR system by pressing DOLBY NR.
7 If you want to make a "EDIT CD recording", follow from here the instructions for EDIT CD.

8 Start the recording by pressing CD ▶TAPE.
→ The display shows COPY. With a delay of 7 sec (leader tape of the tape), playing of the CD or program starts automatically. At the end of the first side, recording stops somewhere within the running track.
→ When ⊐ is selected, the tape direction is reversed and recording continues with the beginning of the incompletely recorded track.
→ Recording will stop when it's finished according to the chosen play mode or when the CD player reaches the end of the CD or the program.



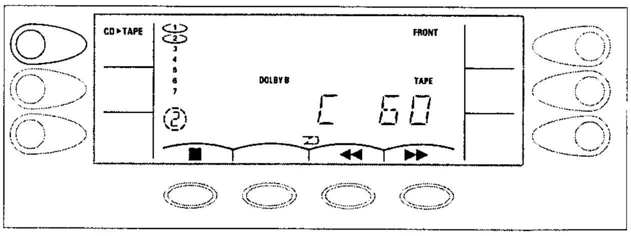
- Press ■ (or STOP ■ on the remote control) to stop the recording at an earlier stage.

EDIT CD – automatic CD track selection by specifying the tape length

To prevent that at the end of the tape the recording is interrupted somewhere within a track, you can use the EDIT CD feature. However, it can only be used for CDs with a maximum of 30 tracks.

The unit automatically selects the total number of tracks that will fit onto each tape side.
The original order of tracks will not be changed.

1 Press EDIT CD.
→ SELECT TAPE LENGTH and C60 appear on the display.



2 Press ◀◀ or ▶▶ until the desired tape length appears on the display (on the remote control use the buttons |◀ or ▶|.
→ The display shows in turn:
C60→C90→C 100→C 120→C30→C45→C60→...
3 Start the recording by pressing CD ▶TAPE.
→ With a delay of 7 sec (leader tape of the tape), playing of the CD or program starts automatically.
→ Recording will stop when it's finished according to the chosen play mode or when the CD player reaches the end of the CD or the program.

- Press ■ (or STOP ■ on the remote control) to stop the recording at an earlier stage.

- You can change the type of the CD time information, by repeatedly pressing DISPLAY MODE on the unit:
→ The display shows in turn: REMAINING TIME OF CURRENT TRACK→ REMAINING TIME OF CURRENT TAPE SIDE→ELAPSED TIME OF CURRENT TRACK→...

TAPE DECKS

Dubbing tapes (copying from TAPE 1 to TAPE 2)

1 Insert a recorded tape into deck 1 and a blank tape into deck 2.
2 Press TAPE 1 and prepare the deck for the recording:
- Select the tape side by pressing SIDE: FRONT or BACK.
- Select the play mode by pressing PLAY MODE until the desired indicator lights up: ⇄ or ⟲.

3 Press TAPE 2 and select the tape side by pressing SIDE: FRONT or BACK.
4 Press DUBBING and thereafter select the dubbing speed by pressing ◀◀ or ▶▶.
→ The display shows NORMAL (normal speed) or FAST (high speed). During high-speed dubbing, the sound is reduced to a low volume.
5 Start recording by pressing DUBBING.
→ Both decks start running and either NORM 000 (normal speed dubbing) or FAST 000 (fast speed dubbing) appears.
→ Recording will stop when one or both sides of the tape are full (depending on the chosen play mode).

- Press ■ (or STOP ■ on the remote control) to stop the recording at an earlier stage.

Notes:
- *PRESS STOP FIRST will light up if you press SIDE: you cannot reverse the playback direction during dubbing.*
- *During dubbing you can listen to any other sound source.*

RECORD ●

1 As soon as you press RECORD ●, the current sound source(CD, TUNER, TAPE 1 or MULTIMEDIA) will be recorded on TAPE 2.

Erase an old tape by recording a silence:
Select CD without starting CD play and press RECORD TAPE ●.

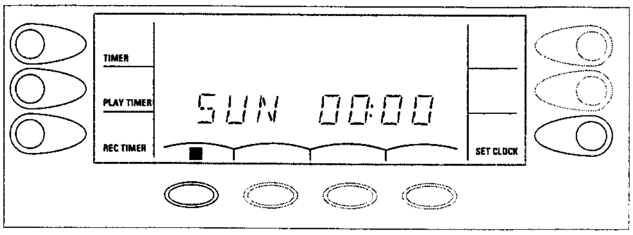
2 To stop recording, press ■.

CLOCK / TIMER

General

The display shows the weekday and the time. The clock display will flash and has to be set
- when you first plug the unit into the mains, or
- if the power supply was interrupted for longer than 10 minutes.

- Press CLOCK·TIMER to enter the clock/timer mode.
→ The clock/timer display with its available display button functions appears:

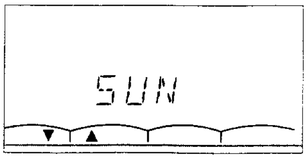


- To leave the timer display, press ■, CLOCK·TIMER, POWER ON/STANDBY or any sound source selection button.

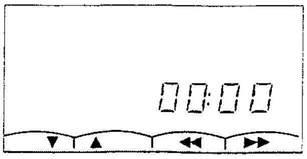
Notes:
- *The clock and the timer cannot be set with the remote control.*
- *If no button is pressed for more than 90 seconds, the clock setting mode is left automatically without storing the last changes..*

Setting the clock

1 Press CLOCK·TIMER to enter the clock/timer mode.
→ The clock/timer display as shown above appears.
2 Press SET CLOCK to enter the clock setting mode.
→ The function indicator SET CLOCK starts flashing.
3 Select the day by pressing ▲ or ▼ until the correct day is indicated.



4 Confirm the day by pressing SET CLOCK.
→ The hour and the minute digits appear.

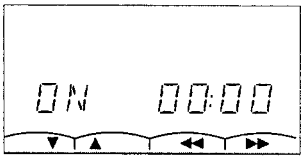


5 Adjust the hours by using ▲▼ and the minutes by using ◀◀ ▶▶.
→ When pressing the buttons briefly, the digits will change step-by-step. By pressing longer, the running speed will increase after a few seconds.
6 Press SET CLOCK to store the setting and to leave the clock setting mode.
→ The clock starts running.

CLOCK / TIMER

Setting the timer for a radio recording

1 Insert a tape into TAPE 2.
2 Press CLOCK·TIMER to enter the clock/timer mode.
  → The clock/timer display appears.
3 Press REC TIMER to enter the timer setting mode.
  → The function indicator REC TIMER starts flashing and a radio preset appears.
4 Press ▲ or ▼ until the desired preset station is indicated.
5 Confirm the preset station by pressing REC TIMER.
  → The message ON and the time appear. The ***recording start time*** must be entered.



6 Adjust the hours and the minutes by using ▲▼ and ◀◀ ▶▶.
7 Confirm the start time by pressing REC TIMER.
  → The message OFF and the time appear. The ***recording stop time*** must be entered.
8 Adjust the hours and the minutes by using ▲▼ and ◀◀ ▶▶.
9 Press REC TIMER to confirm the settings and to leave the timer setting mode.
  → The timer is activated and TIMER lights up on the display.

Setting the timer for playback

1 Press CLOCK·TIMER to enter the clock/timer mode.
  → The clock/timer display appears.
2 Press PLAY TIMER to enter the timer setting mode.
  → The function indicator PLAY TIMER starts flashing and the last selected timer sound source appears.
3 Press ▲ or ▼ until the desired sound source is indicated.
4 Confirm your selection by pressing PLAY TIMER.
  → If you have selected TUNER, press ▲ or ▼ to select the desired preset station.
  → If you have selected CD, insert a CD and press ▲ or ▼ to select the desired CD (DISC 1 to DISC 7) or PROGRAM (if preset).
  → If you have selected TAPE, insert a tape into the cassette compartment.
5 Confirm your selection by pressing PLAY TIMER.
  → The message ON and the time appear. The ***start time*** must be entered.
6 Adjust the hours and the minutes by using ▲▼ and ◀◀ ▶▶.
7 Press PLAY TIMER to confirm the settings and to leave the timer setting mode.
  → The timer is activated and TIMER lights up on the display.

At the preset start time ...

→ The power is turned on or, if another sound source is selected, the set switches to the preset source. The preset source comes on automatically.

→ 15 minutes after playback of the CD or the tape has finished, the system switches to standby. If the timer is activated with the TUNER mode, the sound remains on until you switch off the system.

Notes:
- If the set was activated from standby mode and no button is pressed for more than 40 minutes, the power is turned off again.

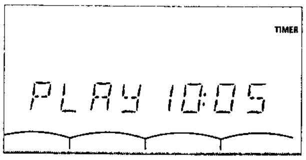
- If there is the same start time for REC TIMER and PLAY TIMER, the REC TIMER will be activated.

- If you are recording at the time the timer is activated, the timer function will be cancelled.

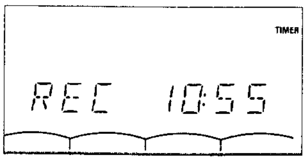
Reactivating/deactivating the timer

1 Press CLOCK·TIMER to enter the clock/timer mode.
  → The clock/timer display appears.
2 To switch off or to reactivate a timer function, press TIMER several times until the required indication appears:

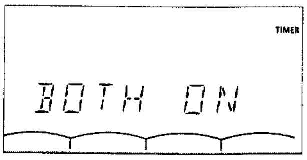
→ PLAY (playback) and the programmed start time for activating the PLAY TIMER.



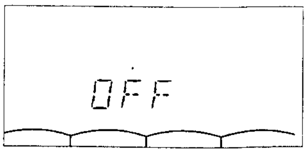
→ REC (recording) and the programmed start time for activating the REC TIMER.



→ BOTH ON - both PLAY TIMER and REC TIMER are activated.

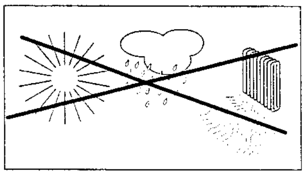


→ OFF for switching the timer off.

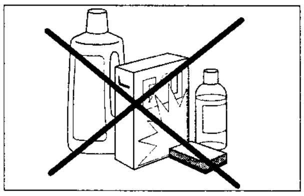


MAINTENANCE

General maintenance

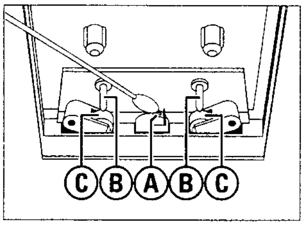


- Do not expose the set, CDs or tapes to humidity or rain, sand or to excessive heat caused by heating equipment or direct sunlight.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated!



- You can clean the set with a soft, slightly dampened chamois leather. Do not use any cleaning agents as they may have a corrosive effect.

TAPE decks



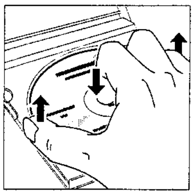
To ensure a good recording and playback quality, clean the head Ⓐ, the capstans Ⓑ and the rubber pressure rollers Ⓒ after approx. 50 hours of operation.

- Use a cotton bud slightly moistened with alcohol or a special head cleaning fluid.

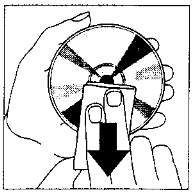
Note: Cleaning of the heads Ⓐ can also be done by playing a cleaning tape through once.

CD player and CD handling

- The lens may cloud over when the set is suddenly moved from cold to warm surroundings. Playing a CD is then not possible. Leave the set in a warm environment until the moisture evaporates.



- To take the CD out of its box easily, press the centre spindle while lifting the CD.
- Always pick up the CD by the edge and put it back in its box after use.



- To clean the CD, wipe in a straight line from the centre towards the edge using a soft, lint-free cloth. A cleaning agent may damage the CD!
- Never write on a CD or attach any sticker to it.
- This set is designed for normal CDs. Therefore, do not use any accessories like CD stabilizer rings or CD treatment sheets, etc. as offered on the market because it may cause a jamming of the CD changer mechanism.

TECHNICAL DATA

Technical data *(subject to modification)*

AMPLIFIER

Output power:	2x 65 W RMS/6 Ω/THD 10% 3 x 50 W + 25 W RMS/6 Ω/THD 10%
Music Power:	3 x 115 + 60 W
Power bandwidth:	40 - 20000 Hz
Frequency response:	50 - 18000 Hz
Signal-to-noise ratio:	≥ 67 dBA (IEC)
Impedance Loudspeakers:	≥ 6 Ω
Impedance headphones:	8 Ω - 1000 Ω (3 Vemk - 150 Ω)

TUNER

FM wave range:	87.5 - 108 MHz
MW wave range:	531 - 1602 kHz
LW wave range	153 - 279 kHz
Sensitivity at 75 Ω - mono, 26 dB signal-to-noise ratio:	2.8 µV
- stereo, 46 dB, signal-to-noise ratio:	61.4 µV
Selectivity:	≥ 28 dB
Total harmonic distortion:	≤ 5%
Frequency response:	63 - 12500 Hz (± 3 dB)
Signal-to-noise ratio:	≥ 50 dBA

CD PLAYER

Frequency range:	20 - 20000 Hz
Signal-to-noise ratio:	90 dBA
Channel separation	60 dBA
Total harmonic distortion:	≥ 75 dB
Conversion:	Continuous Calibration 4x oversampling

TAPE DECKS

Frequency response: - CrO2 tape (type II):	60-14000 Hz (8 dB)
- Normal tape (type I):	60-14000 Hz (8 dB)
Signal-to-noise ratio (without Dolby NR):	
- CrO2 tape (type II)	
- Normal tape (type I):	47 dB
Signal-to-noise ratio (with Dolby NR):	
- CrO2 tape (type II)	
- Normal tape (type I):	55 dB
Wow and flutter:	≤ 0.4% DIN

SPEAKERS

System	shielded 3-way double bass reflex
Impedance	6 Ohms
Bass speaker	5 1/4 inch woofer
Mid/treble speaker:	2 1/2 inch tweeter
Upper treble	piezo tweeter
Dimensions (wxhxd):	210 x 310 x 251 mm

General

Dimensions (wxhxd):	240 x 310 x 310 mm
Weight (with/without speakers):	approx. 17.5/11 kg

TROUBLESHOOTING

- If a fault occurs, first check the points listed below before taking the set for repair.
- If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

WARNING:

Under no circumstances should you try to repair the set yourself, as this will invalidate the guarantee.

PROBLEM	POSSIBLE CAUSE	REMEDY
No power	Mains lead is not securely connected.	Connect the mains lead properly.
No or poor sound	VOLUME is not turned up.	Turn up the VOLUME.
	Speakers are wrongly or not connected.	Check the speaker connections.
	Unsuited speakers are used.	Use recommended speakers, impedance 6 Ohms.
	Badly matching equalizer setting for the given type of music.	Choose a matching equalizer setting for the given type of music.
	Headphones are connected.	Disconnect the headphones.
Reversed left and right sound	Speakers are wrongly connected.	Connect the speaker cables correctly.
Signal through center speaker only with Dolby Pro Logic or 3 Stereo	The source signal is mono.	Switch off Dolby Pro Logic or 3 Stereo.
System does not react to operation of any button	Electrostatic discharge.	Disconnect the set from power supply and reconnect it after a few seconds.
Poor radio reception	FM antenna is not connected.	Connect the FM antenna.
	Interference caused by the vicinity of electrical equipment like TVs, video recorders, computers, etc.	Keep the set away from electrical equipment.
The CD skips tracks	CD is damaged or dirty.	Replace or clean the CD.
Poor tape sound quality	Dust and dirt on the heads, capstan or pressure roller.	Clean the heads, capstan and pressure roller, see maintenance.
Remote control does not work	The distance to the system is too large.	Reduce the distance.
	Wrong sound source is selected.	Select the sound source before pressing the functional button.
	Batteries are incorrectly inserted.	Insert the batteries correctly.
	Batteries are exhausted.	Replace the batteries.

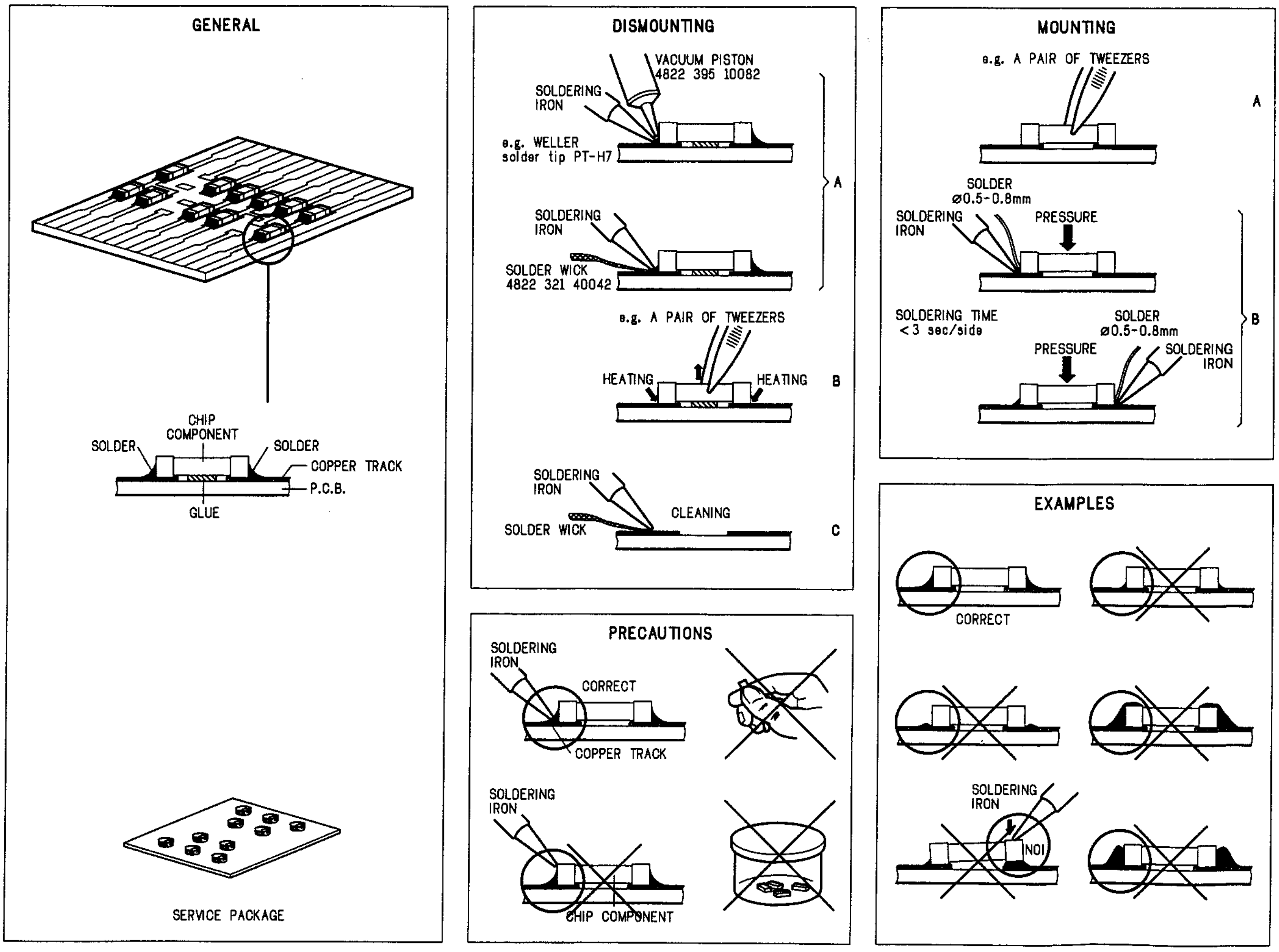
DISPLAY INDICATION	POSSIBLE CAUSE	REMEDY
NO DISC ***or*** CANNOT READ	CD is badly scratched or dirty.	Replace or clean the CD, see maintenance.
	No CD inserted.	Insert a CD.
	CD inserted upside down.	Insert a CD with label upwards.
	Laser lens is steamed up.	Wait until the lens has acclimatized.
WRONG TRACK	The selected track number does not exist on this CD or is not included in this program.	Select a correct track number.
TAPE PROTECTED	Tape is protected against recording.	Replace the tape or undo the protection.
EDIT NOT POSSIBLE	The EDIT CD feature can only be used for CDs with a maximum of 30 tracks.	Use another CD with less than 30 tracks or create a program with less than 30 tracks.

SERVICE HINTS

Service Tools

TORS screwdriver set SBC 163	4822 295 50145
Audio signal disc SBC 429	4822 397 30184
Test disc 5 (disc without errors)+	
Test disc 5A (disc with dropout errors, black spots and fingerprints) SBC 426/426A.	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without 'pause')	4822 397 30155
Dolby Prologic test CD	4822 395 10216
Universial test cassette Fe SBC 420	4822 397 30071
Universial test cassette CrO2 SBC 419	4822 397 30069

Handling Chip Components


GENERAL
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER solder tip PT-H7
A
SOLDERING IRON
SOLDER WICK 4822 321 40042
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
CLEANING
SOLDER WICK
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER ø0.5-0.8mm
SOLDERING IRON
PRESSURE
SOLDERING TIME <3 sec/side
SOLDER ø0.5-0.8mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
CORRECT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
CORRECT
SOLDERING IRON
NO!

)ISMANTLING INSTRUCTIONS

)ismantling of Cassette flap

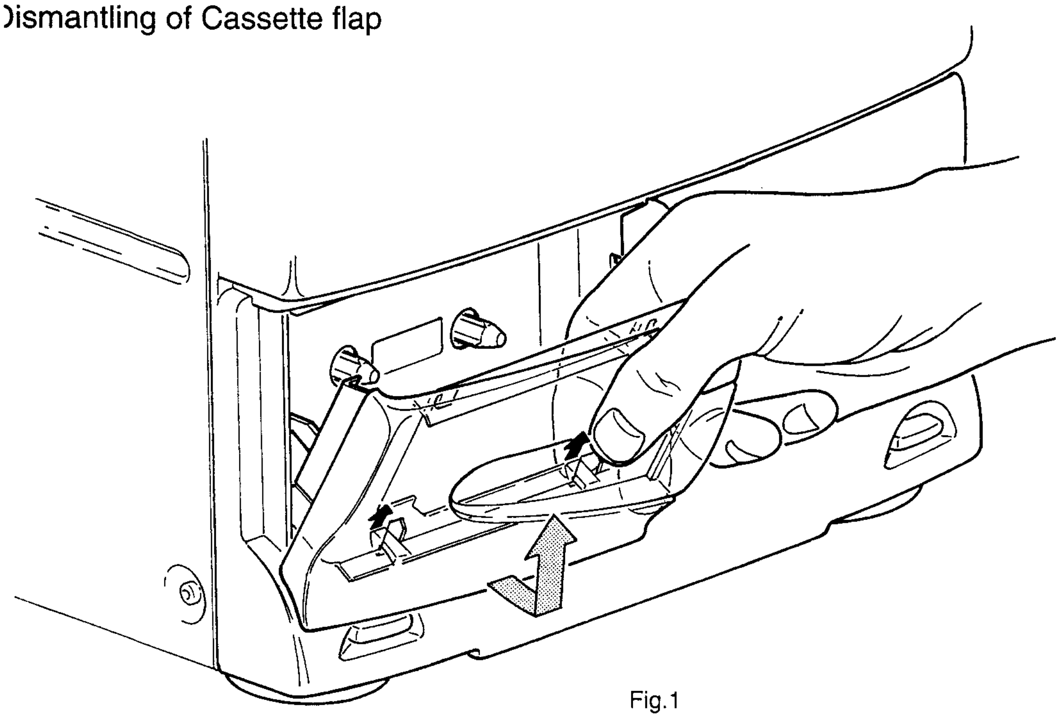


Fig.1

)ismantling the Karaoke Top (not on all Versions)

) Release the two snaps on back sode
) Lift the back side ov the cover first

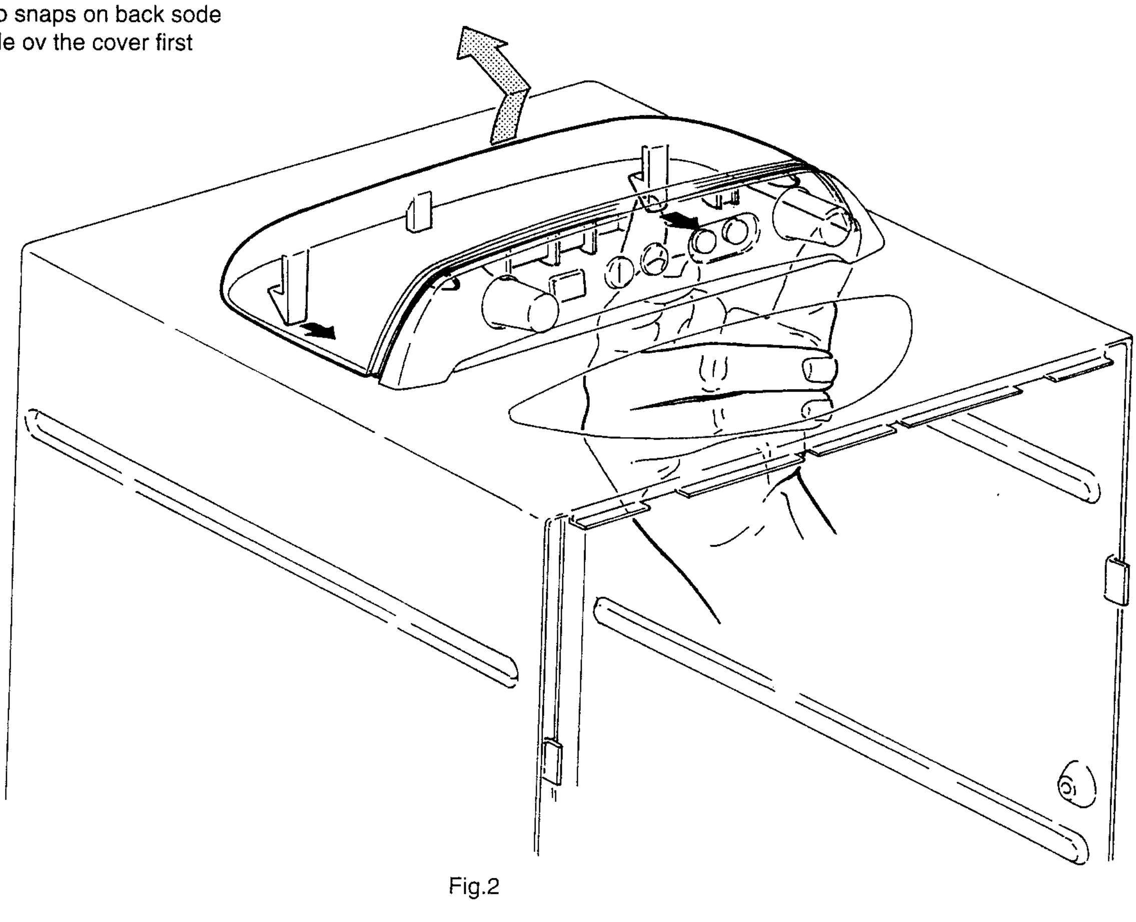
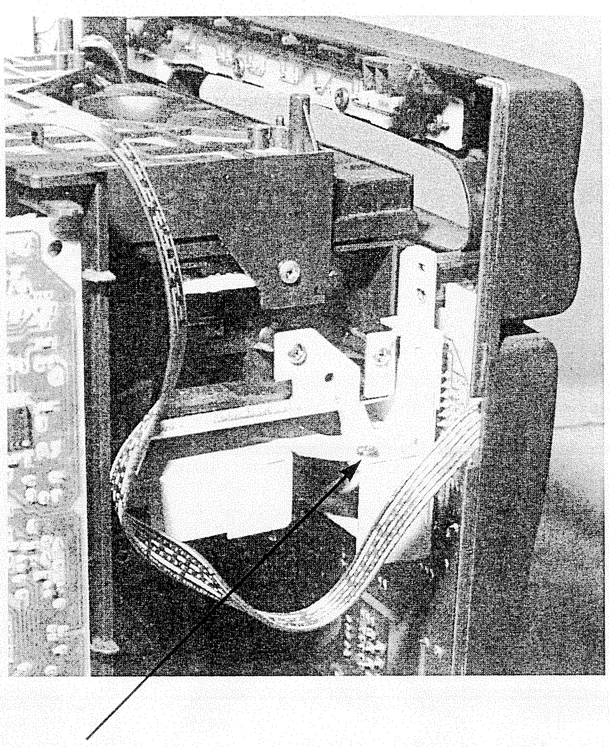


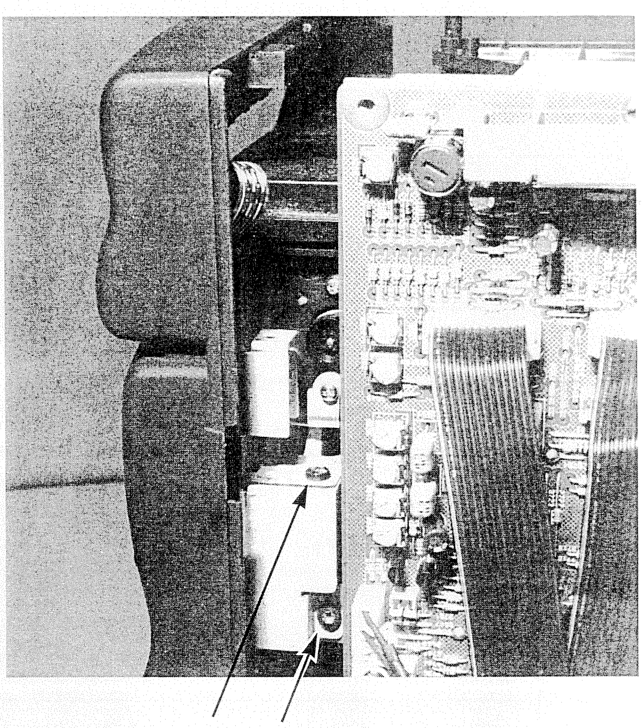
Fig.2

Dismantling of Front

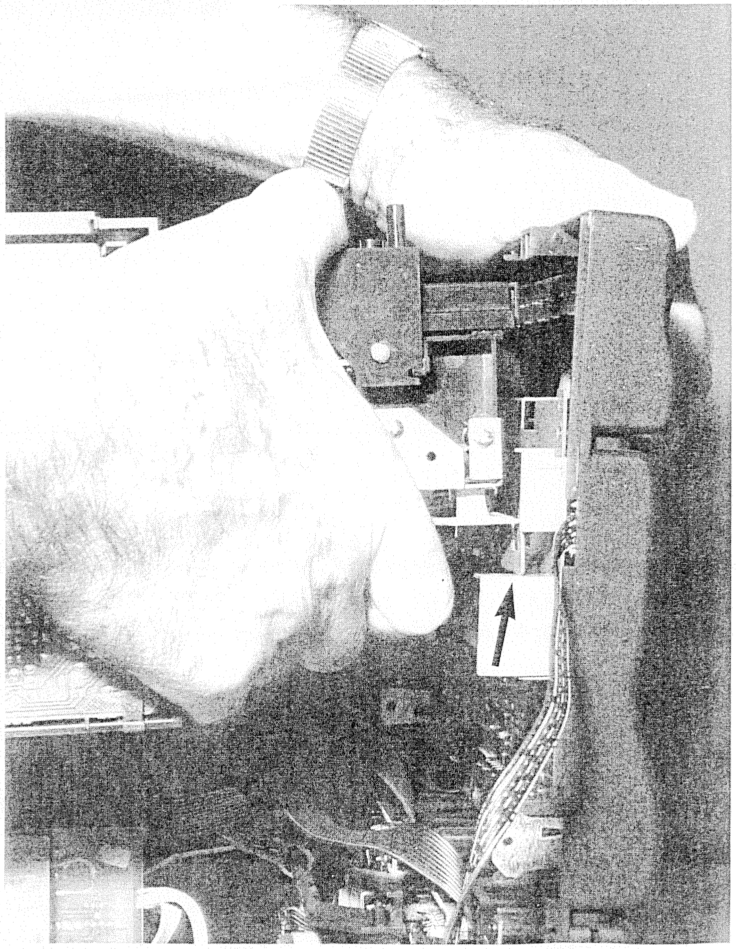
1) Remove top cover + Front CDC tray
2) Loosen 3X screw on bottom.



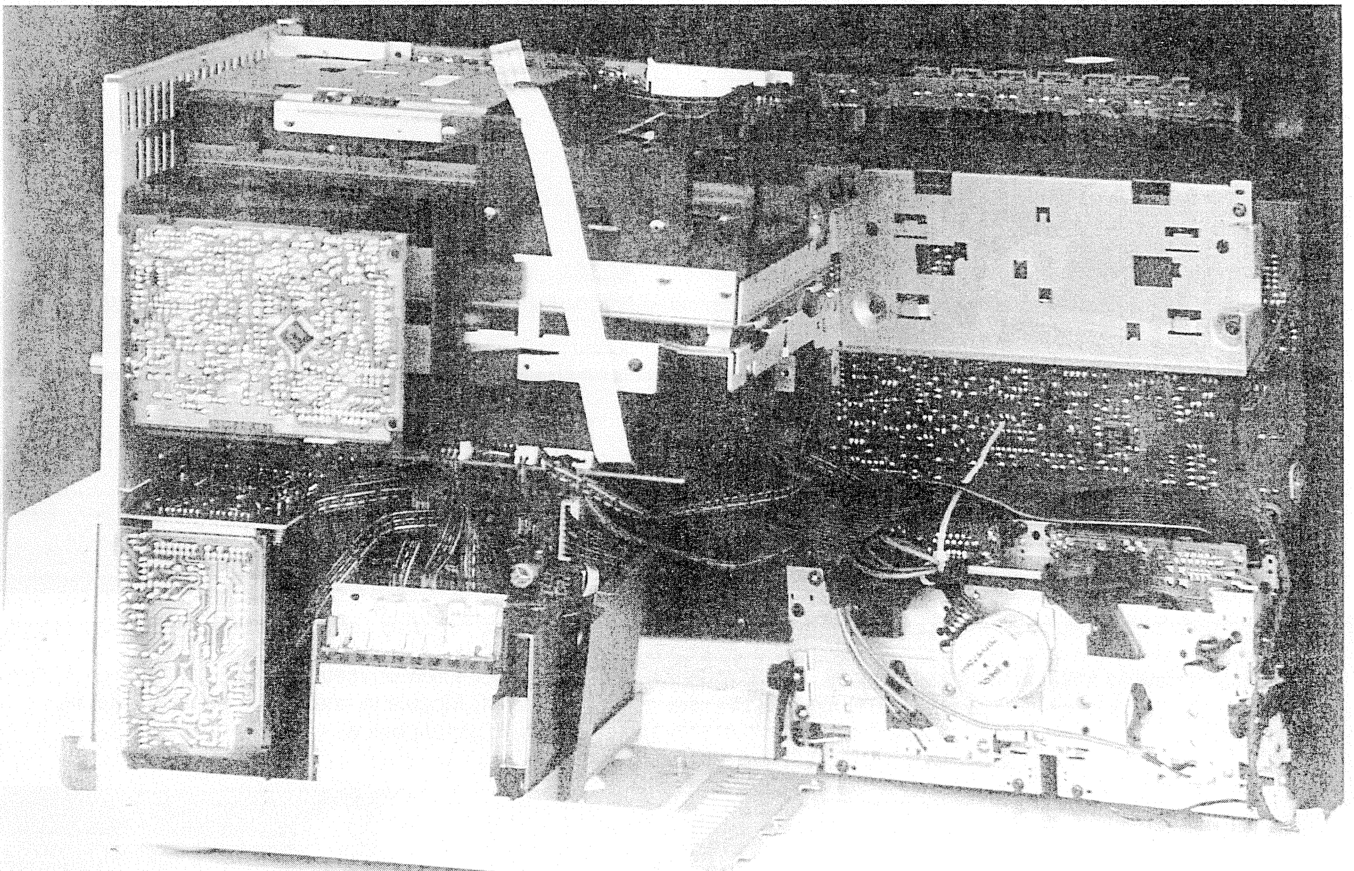
3) Loosen screw on metal bracket



3) Loosen 2x screw on metal bracket
4) Lift the CD Module to release the metal bracket as shown in picture below.

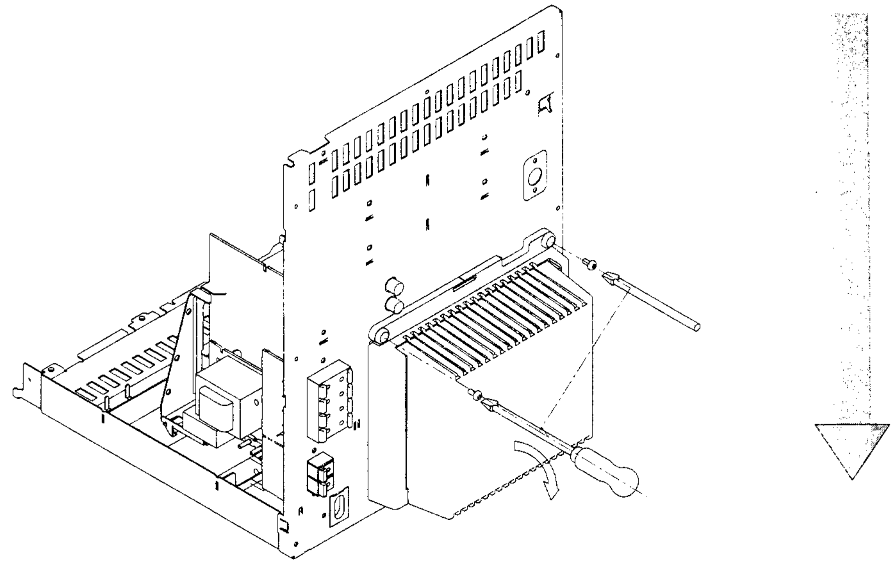


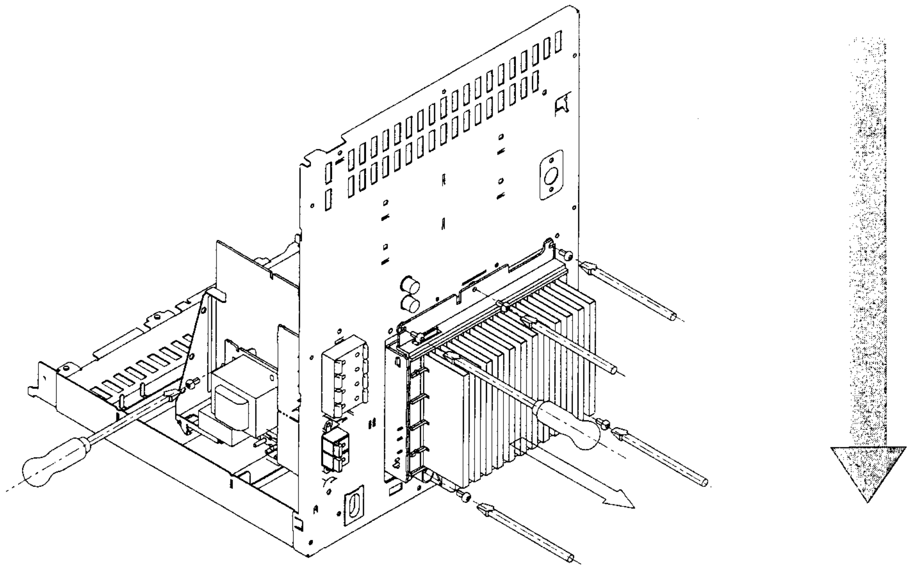
5) Turn the front sidewards as shown below.

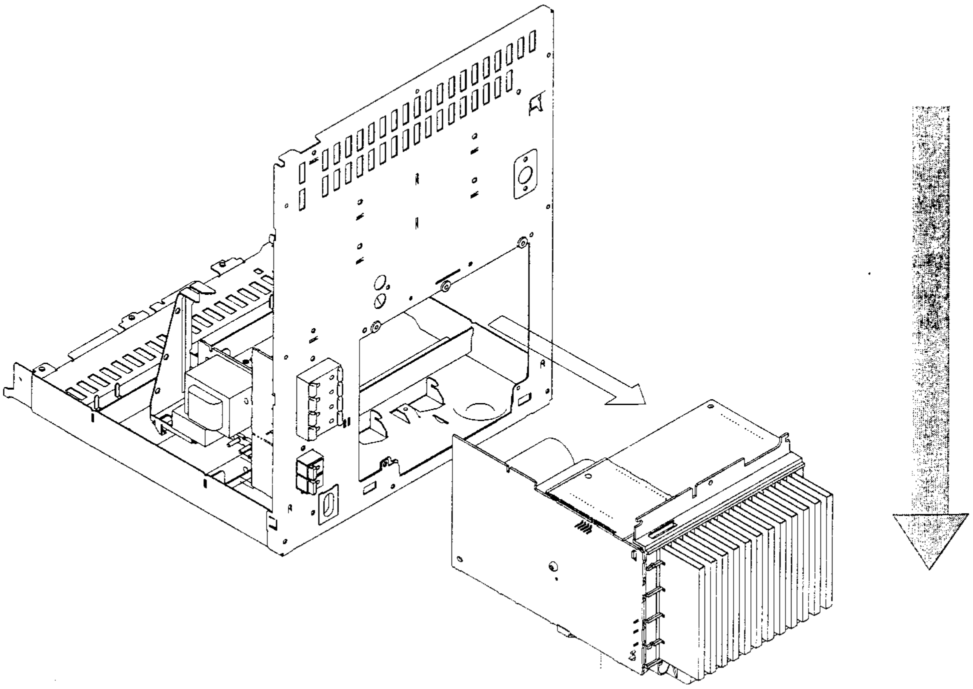


Dismantling of Power Module

Following instructions as shown in drawings below.







Dismantling of Dolby Prologic printboard:

1. Remove Tuner board

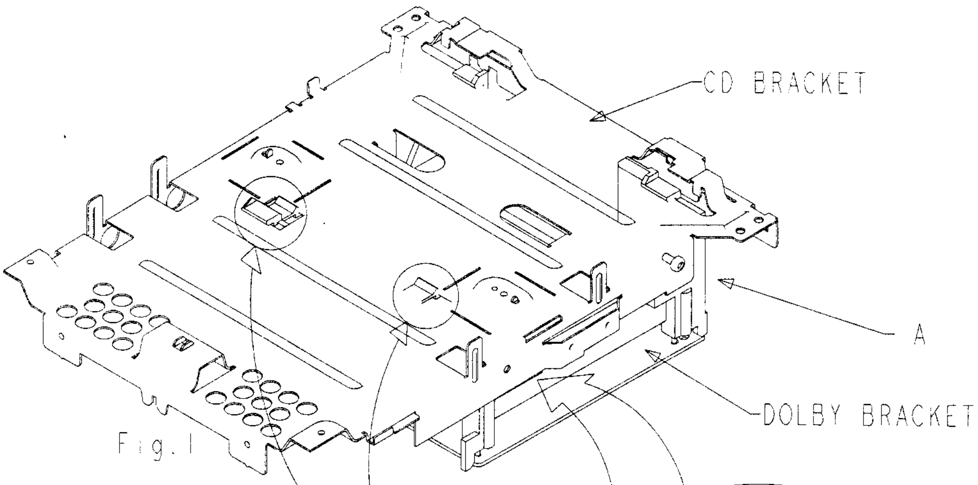

CD BRACKET
A
DOLBY BRACKET

Fig. 1

2. Remove screw A (see fig 1)

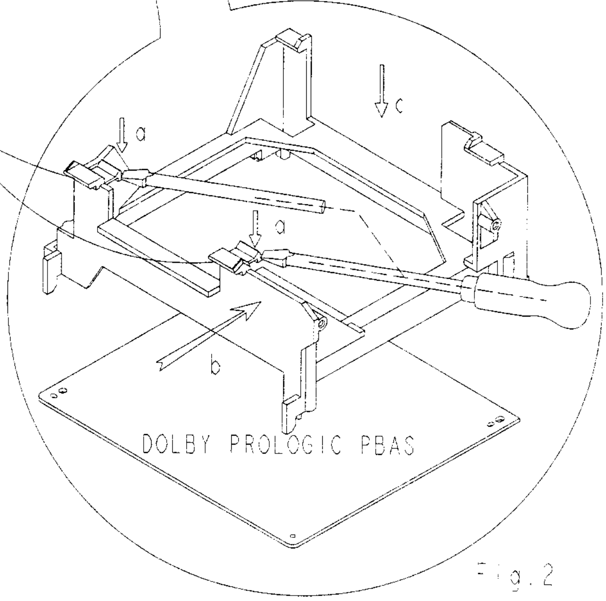
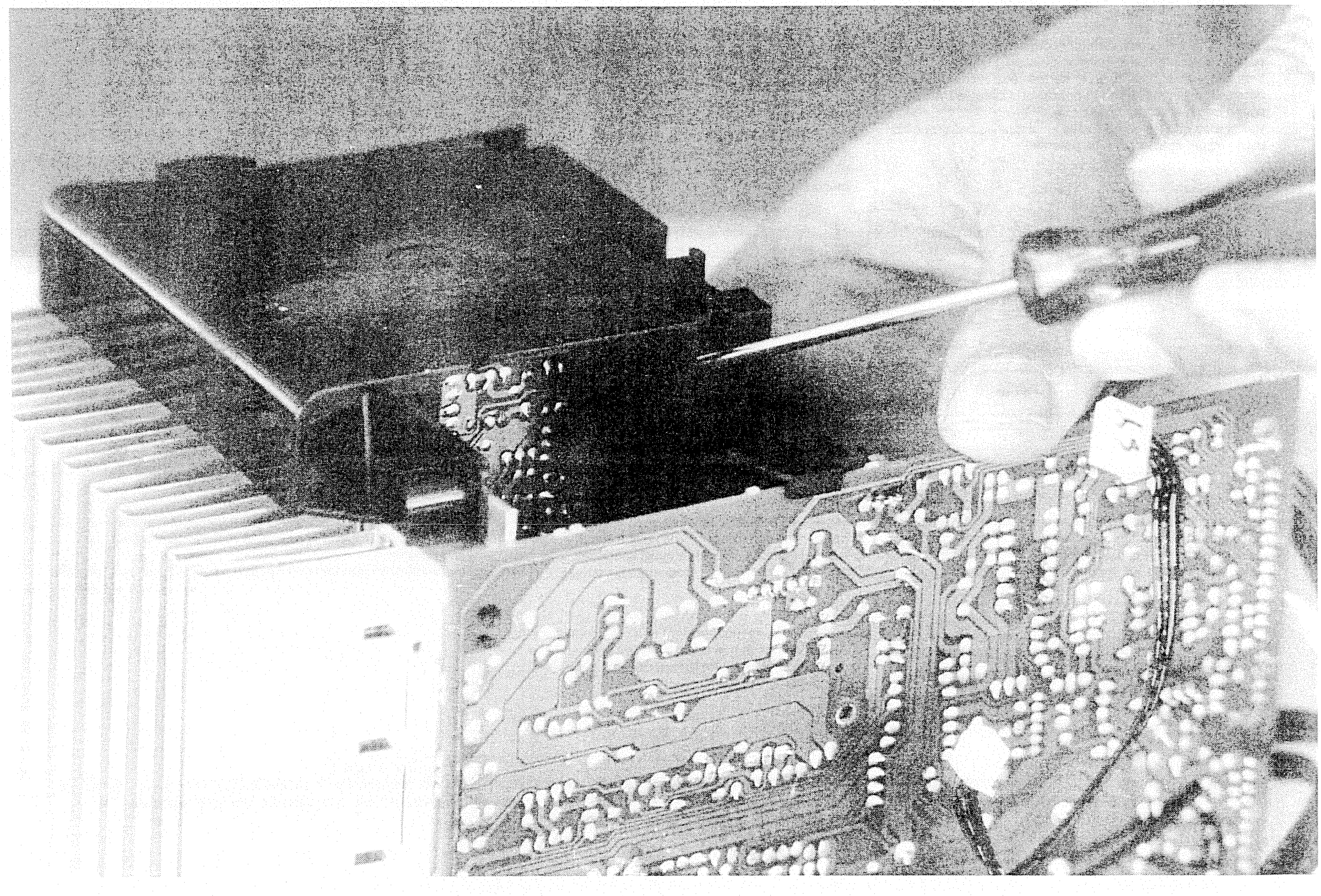

a
c
a
b
DOLBY PROLOGIC PBAS

Fig. 2

3. Before remove the Bolby Prologic PBAS
   we have to remove the Dolby bracket from the CD bracket.
   Following the next instructions:
   - Put a screw drive between the CD bracket and Dolby bracket to release the two snaps (see fig 2 arrow a)
   - Press the bracket a little to right (arrow b) and then down (arrow c).
   - The bracket can now removed out the set.

Dismantling of Fan Holder

1- Remove : 1 screw on the powersupply board
1 screw on the 2 channel amplifier board
2- Pusch snap and lift up at the same time the fan holder as shown below



Warnings & Safety

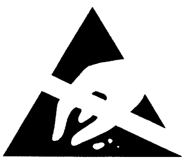
(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

ESD



(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen vermindern. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen cok op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delápparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

SAFETY

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.
Safety components are marked by the symbol ⚠

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.
Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.
Componenty di sicurezza sono marcati con ⚠

(F)
Les normes de sécurité exigent que l´appareil soit remis à l´état d´origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.
Les composants de sécurité sont marqués ⚠

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.
De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

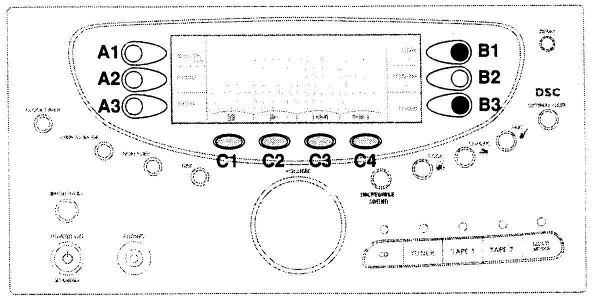
(DK) Advarsel !

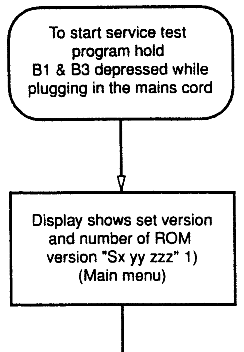
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(FIN) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

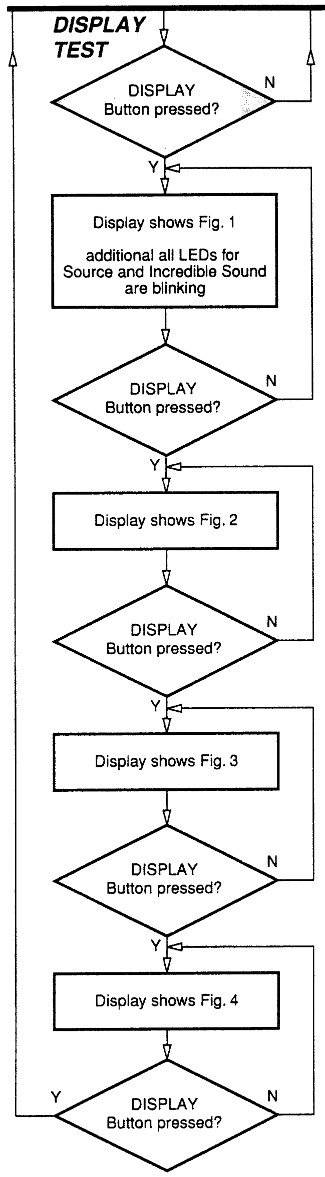

A1
A2
A3
B1
B2
B3
DSC
C1
C2
C3
C4

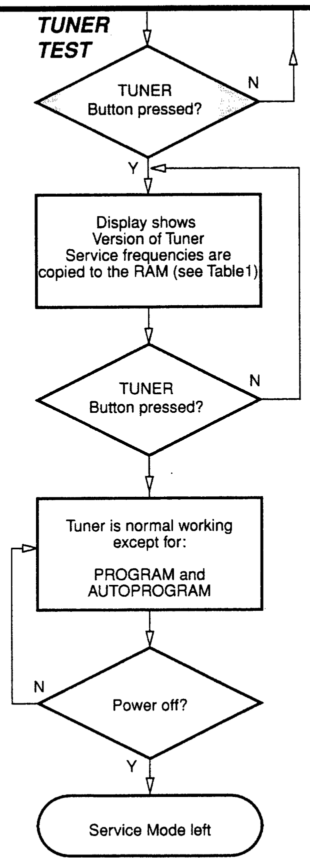

To start service test program hold B1 & B3 depressed while plugging in the mains cord
Display shows set version and number of ROM version "Sx yy zzz" 1) (Main menu)

1) S stands for Service Testprogram
S1 stands for sets with CD
S2 stands for sets with CD Changer and RDS
S3 stands for sets with CD Changer without RDS
S4 stands for sets with CD Changer and Videomodule
S5 stands for sets with CD Changer and Pro-Logic

yy stands for software version number of µP on Front Board
(counted upwards from A1 to Z9)

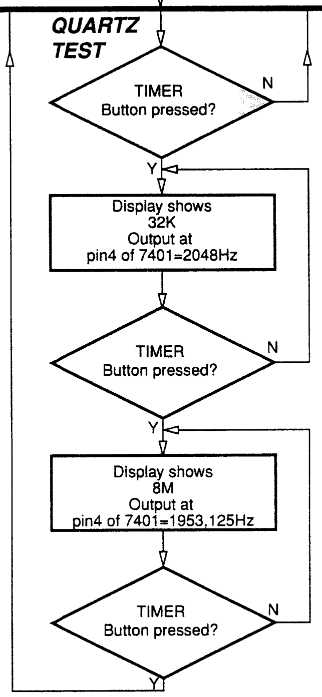
zzz stands for software version number of µP on Combi Board
(counted upwards from 160 to 255)

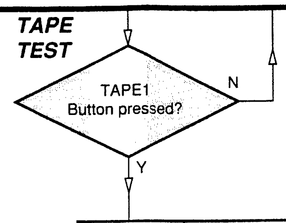

DISPLAY TEST
DISPLAY Button pressed?
N
Y
Display shows Fig. 1
additional all LEDs for Source and Incredible Sound are blinking
DISPLAY Button pressed?
N
Y
Display shows Fig. 2
DISPLAY Button pressed?
N
Y
Display shows Fig. 3
DISPLAY Button pressed?
N
Y
Display shows Fig. 4
DISPLAY Button pressed?
Y
N

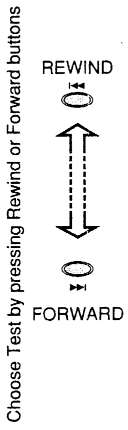

TUNER TEST
TUNER Button pressed?
N
Y
Display shows Version of Tuner Service frequencies are copied to the RAM (see Table1)
TUNER Button pressed?
N
Tuner is normal working except for:
PROGRAM and AUTOPROGRAM
N
Power off?
Y
Service Mode left

PRESET	Europe "EUR"	East Europe "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"
1	108MHz	108MHz	108MHz	108MHz	180MHz
2	87,5MHz	65,81MHz	87,5MHz	87,5MHz	87,5MHz
3	1602kHz	1602kHz	1700kHz	1602kHz	1602kHz
4	531kHz	531kHz	530kHz	531kHz	531kHz
5	279kHz	279kHz	-	-	-
6	153kHz	153kHz	-	-	-
7	98MHz	98MHz	98MHz	98MHz	98MHz
8	558kHz	558kHz	560kHz	558kHz	558kHz
9	1494kHz	1494kHz	1500kHz	1494kHz	1500kHz

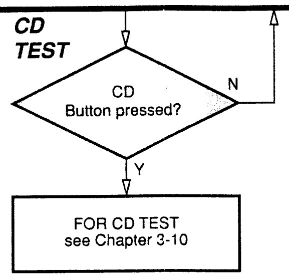
Table 1

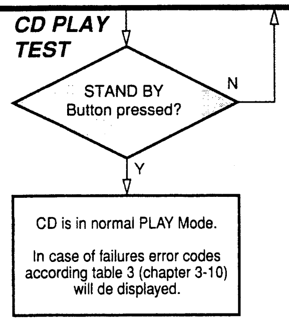

QUARTZ TEST
TIMER Button pressed?
N
Y
Display shows 32K Output at pin4 of 7401=2048Hz
TIMER Button pressed?
N
Y
Display shows 8M Output at pin4 of 7401=1953,125Hz
TIMER Button pressed?
N
Y


TAPE TEST
TAPE1 Button pressed?
N
Y

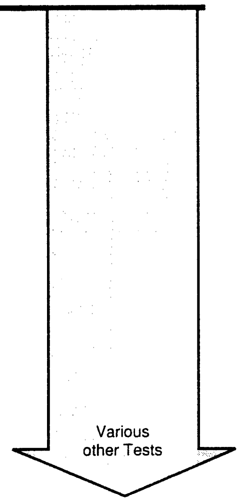

Choose Test by pressing Rewind or Forward buttons
REWIND
FORWARD

STEP	Display shows	ACTION
0	TAPE1	Select Tape1 as sound source
1	COIL	Solenoids of both decks activated for 3 seconds
2	PLAY	Normal Play mode for Deck1
3	FAST	Fast Play mode for Deck1 (High speed)
4	PLAY	Normal Play mode for Deck2
5	FAST	Fast Play mode for Deck2 (High speed)
6	REC	Record mode for Deck2
7	FAST	High speed dubbing
8		Leave Tape Test


CD TEST
CD Button pressed?
N
Y
FOR CD TEST see Chapter 3-10


CD PLAY TEST
STAND BY Button pressed?
N
Y
CD is in normal PLAY Mode.
In case of failures error codes according table 3 (chapter 3-10) will de displayed.

The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittend or not reproducible failures.
The error code indicates where the failure can be found.


Various other Tests

TEST	*Activated with*	*ACTION*
EEPROM TEST	3-STEREO 3-STEREO TO LEAVE	A testpattern will be sent to the EEPROM. Size of the eeprom (1K or 4K) is displayed if the pattern is read back correctly. Otherwise ERR will be displayed.
EEPROM CLEAR	CENTER	Load default data. Display shows NEW for 1 second. ***Caution!*** ***All presets from the customer are lost!!***
KEY TEST	DSC	Key numbers according table 4 are shown on the display. (see Chapter 3-10)
TEMPERATURE TEST	PRO LOGIC	Temperature of the mains transformer is displayed for 2 seconds. At 115° Celsius the µP reduces the output power → DBB off, volume down. ***Values lower than 66°C are meaningless!***
FAST CLOCK TEST	DBB = FAST DBB again = NORMAL	Display shows "FAST" for 2 seconds. The clock is increased by one minute each second. Display shows "NORMAL" for 2 seconds. The clock is working normal.
LEAVE SERVICE TESTPROGRAM	disconnect mains	

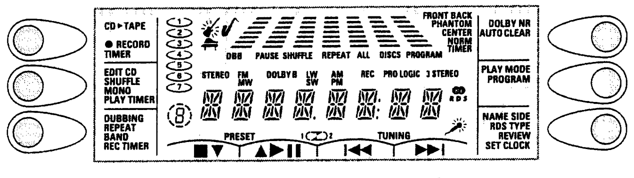

CD▸TAPE
● RECORD
TIMER
EDIT CD
SHUFFLE
MONO
PLAY TIMER
DUBBING
REPEAT
BAND
REC TIMER
FRONT BACK
PHANTOM
CENTER
NORM
TIMER
DOLBY NR
AUTO CLEAR
PLAY MODE
PROGRAM
NAME SIDE
RDS TYPE
REVIEW
SET CLOCK
DBB PAUSE SHUFFLE REPEAT ALL DISCS PROGRAM
STEREO FM MW DOLBY B LW SW AM FM REC PRO LOGIC 3 STEREO
RDS
PRESET
TUNING

Fig.1

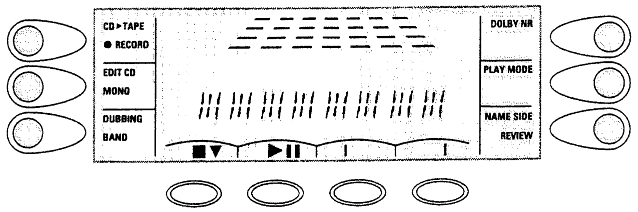

CD▸TAPE
● RECORD
EDIT CD
MONO
DUBBING
BAND
DOLBY NR
PLAY MODE
NAME SIDE
REVIEW

Fig.2

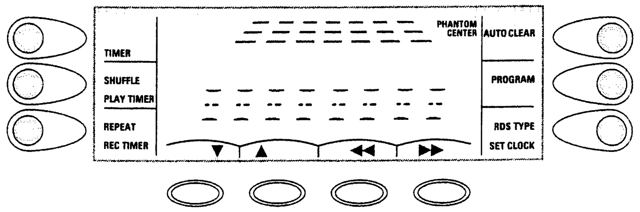

TIMER
SHUFFLE
PLAY TIMER
REPEAT
REC TIMER
PHANTOM
CENTER
AUTO CLEAR
PROGRAM
RDS TYPE
SET CLOCK

Fig.3

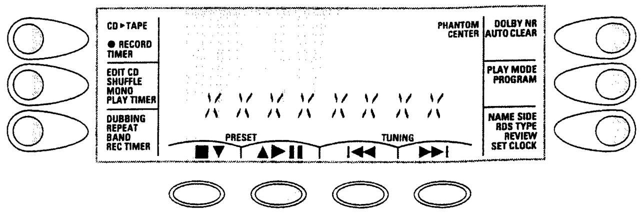

CD▸TAPE
● RECORD
TIMER
EDIT CD
SHUFFLE
MONO
PLAY TIMER
DUBBING
REPEAT
BAND
REC TIMER
PHANTOM
CENTER
DOLBY NR
AUTO CLEAR
PLAY MODE
PROGRAM
NAME SIDE
RDS TYPE
REVIEW
SET CLOCK
PRESET
TUNING

Fig.4

Error number	Error description	Error type
1002	Focus Error. Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during playing the CD.	F
1007	Subcode Error. No subcode could have been read, even not after retrying 10 times to restart the PLL and jumping 10 tracks. When this happens the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W
1008	Out of lead-in during reading TOC Triggered when during reading the TOC the lead-in (track no. 0) is left. This can be caused by a misaligned inner-switch or by a disc with a mispositioned lead-in.	W
1010	Radial error Triggered when the radial servo is not on track for a certain time during playing the CD.	F
1011	Sledge error Generated when the inner-switch did not open within a certain time when the pick up is moved from the inner position outside.	W
1012	Fatal sledge error Generated when the inner-switch did not close within a certain time when the pick up is moved inside. Inner-switch or sledge motor problems.	F
1013	Turntable motor error. Generated when the CD did not reach 75% of speed during startup within a certain time. Discmotor problem.	F
1020	PLL lock error. When the PLL did not lock after 10 retries then this warning message is generated and the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W
1070	Carriage did not reach the play position within a certain time.	F
1071	Carriage did not reach the stocker within a certain time.	F
1072	Carriage did not pass the play position within a certain time.	F
1076	Desired disc position of the stocker could not be reached within a certain time.	W
1077	Generated when the cam is moved and either SW1 or SW2 did not open within a certain time.	F
1078	Generated when the cam is moved and either SW1 or SW2 did not close (reach the new position) within a certain time.	F
1079	Tray open position not reached within a certain time.	W
1080	Miscounting of the stocker position occured	T

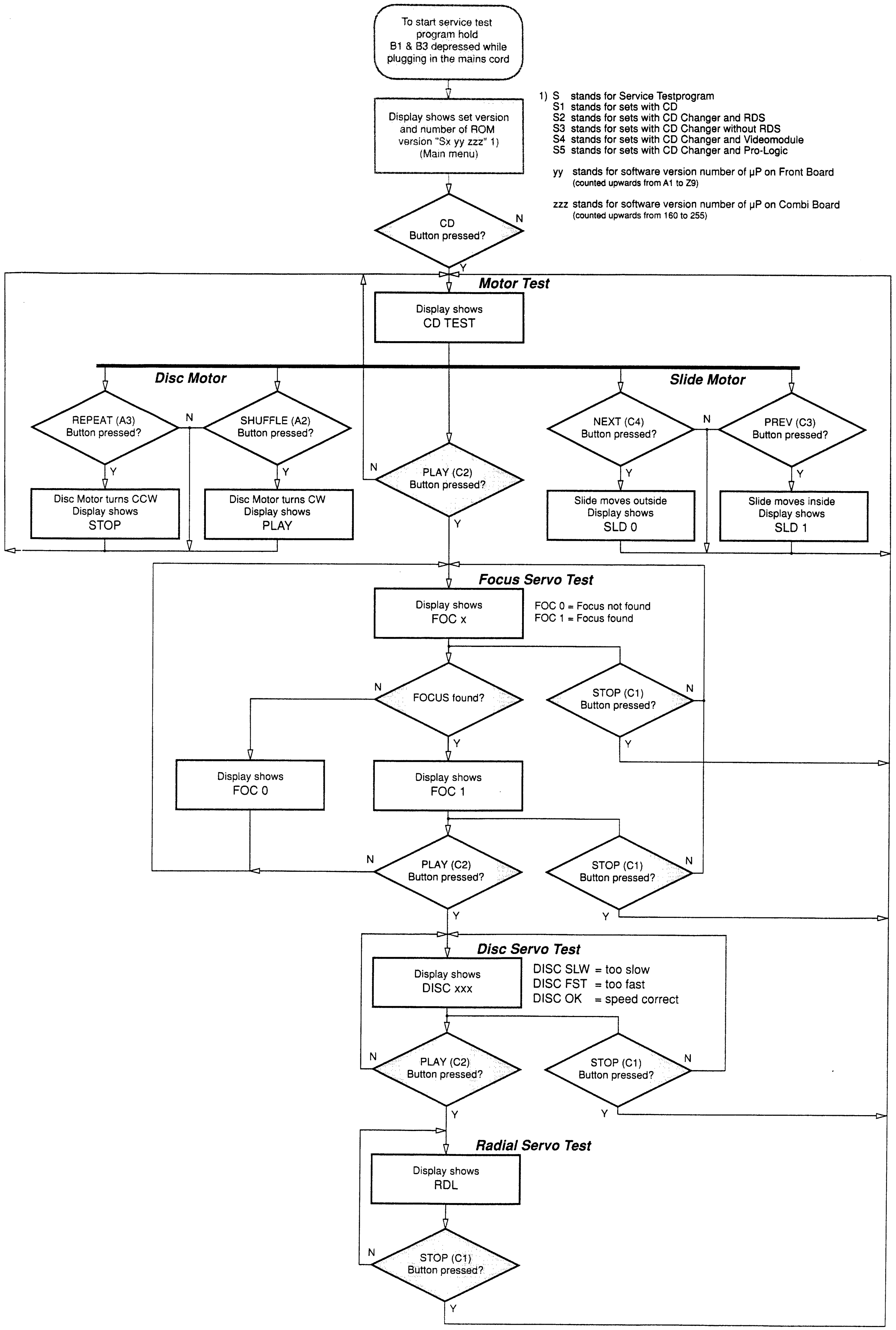
Table 3

W = Warning (Remains on display till next warning/error)
F = FATAL ERROR (Set stops playing → Error remains on the display)

Key activated	Display shows	Key activated	Display shows	Key activated	Display shows
Disc 1	01	B2	14	Center	27
Disc 2	02	B3	15	DSC	leave Test
Disc 3	03	C1	16	Brightness	29
Disc 4	04	C2	17	Power / Stand by	30
Disc 5	05	C3	18	CD	31
Disc 6	06	C4	19	TUNER	32
Disc 7	07	Timer/Clock	20	TAPE 1	33
CD open/close	08	Display	21	TAPE 2	34
Demo	09	Analyzer	22	MULTI MEDIA	35
A1	10	DBB	23	Vocal Cancel	36*
A2	11	Incredible Sound	24	Key Control down	37*
A3	12	Pro Logic	25	Key control up	38*
B1	13	3 Stereo	26	any RC5 Key	RC

Table 4

* For Sets with KARAOKE only

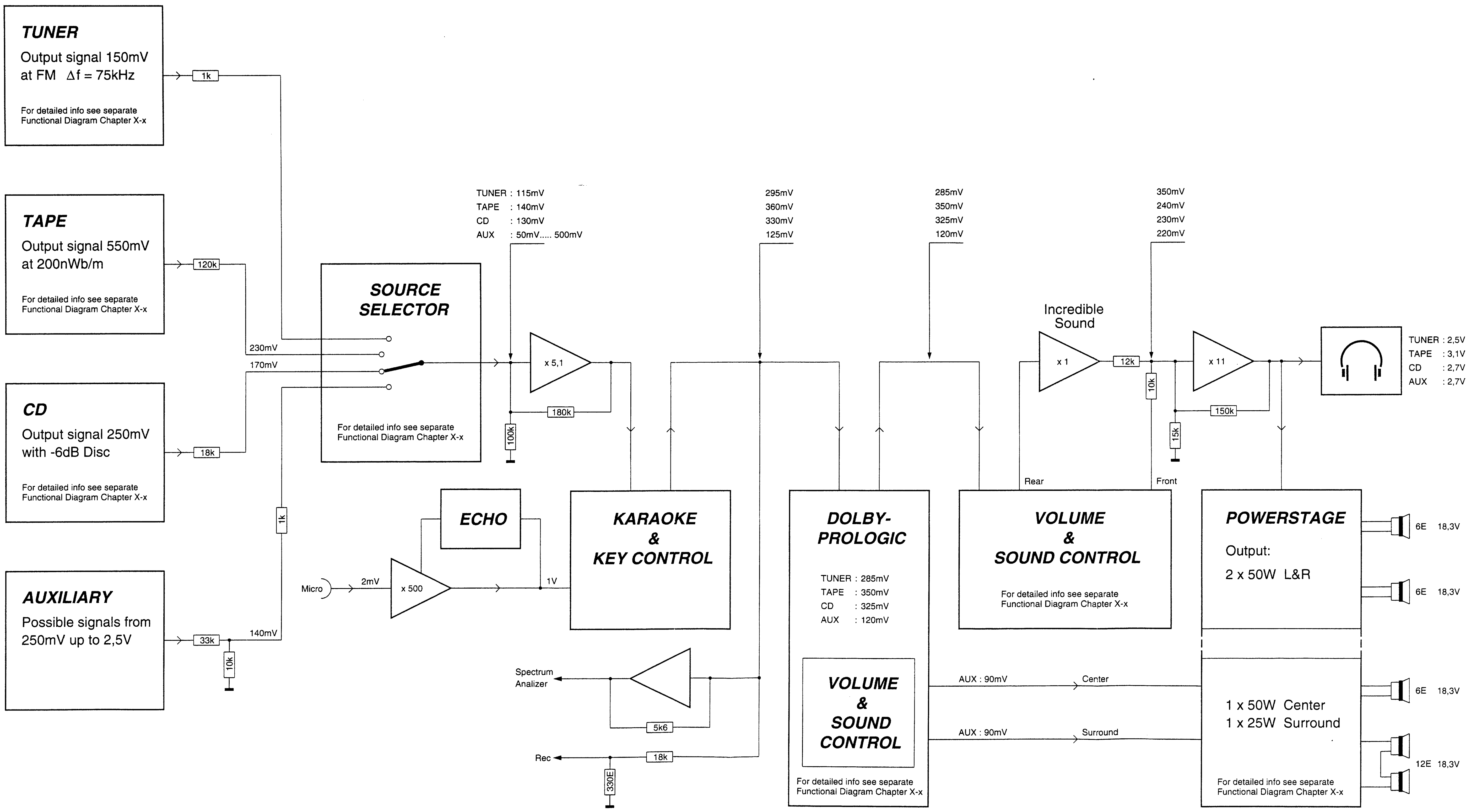

To start service test program hold B1 & B3 depressed while plugging in the mains cord
Display shows set version and number of ROM version "Sx yy zzz" 1) (Main menu)
CD Button pressed?
N
Y
Motor Test
Display shows CD TEST
Disc Motor
Slide Motor
REPEAT (A3) Button pressed?
SHUFFLE (A2) Button pressed?
Disc Motor turns CCW Display shows STOP
Disc Motor turns CW Display shows PLAY
PLAY (C2) Button pressed?
NEXT (C4) Button pressed?
PREV (C3) Button pressed?
Slide moves outside Display shows SLD 0
Slide moves inside Display shows SLD 1
Focus Servo Test
Display shows FOC x
FOC 0 = Focus not found
FOC 1 = Focus found
FOCUS found?
STOP (C1) Button pressed?
Display shows FOC 0
Display shows FOC 1
PLAY (C2) Button pressed?
STOP (C1) Button pressed?
Disc Servo Test
Display shows DISC xxx
DISC SLW = too slow
DISC FST = too fast
DISC OK = speed correct
PLAY (C2) Button pressed?
STOP (C1) Button pressed?
Radial Servo Test
Display shows RDL
STOP (C1) Button pressed?

1) S stands for Service Testprogram
S1 stands for sets with CD
S2 stands for sets with CD Changer and RDS
S3 stands for sets with CD Changer without RDS
S4 stands for sets with CD Changer and Videomodule
S5 stands for sets with CD Changer and Pro-Logic

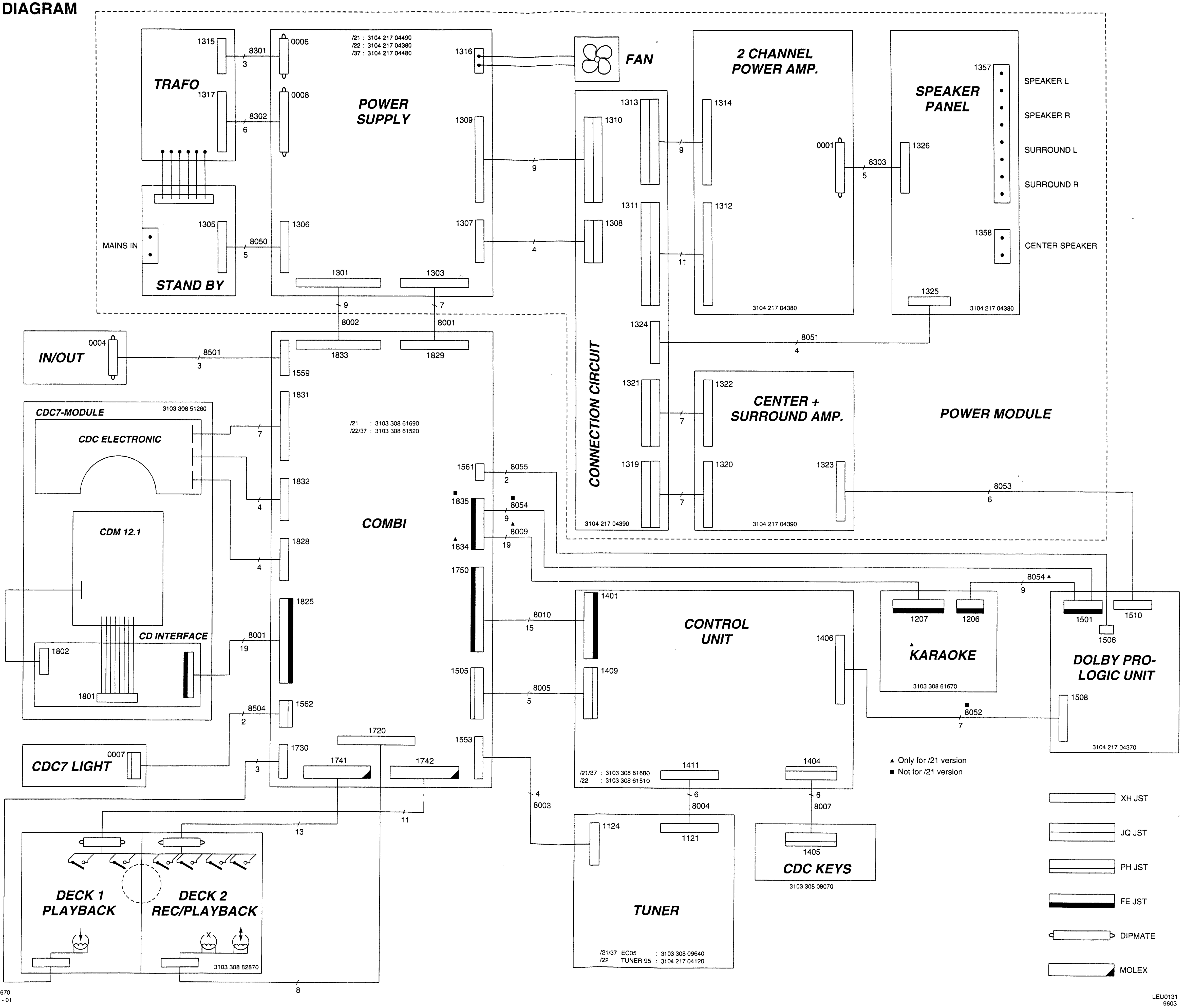
yy stands for software version number of µP on Front Board (counted upwards from A1 to Z9)

zzz stands for software version number of µP on Combi Board (counted upwards from 160 to 255)

BLOCK DIAGRAM SET


TUNER
Output signal 150mV
at FM Δf = 75kHz
For detailed info see separate Functional Diagram Chapter X-x
1k
TAPE
Output signal 550mV
at 200nWb/m
For detailed info see separate Functional Diagram Chapter X-x
120k
CD
Output signal 250mV
with -6dB Disc
For detailed info see separate Functional Diagram Chapter X-x
18k
AUXILIARY
Possible signals from
250mV up to 2,5V
33k
10k
140mV
1k
230mV
170mV
SOURCE SELECTOR
For detailed info see separate Functional Diagram Chapter X-x
TUNER : 115mV
TAPE : 140mV
CD : 130mV
AUX : 50mV..... 500mV
x 5,1
180k
100k
ECHO
Micro
2mV
x 500
1V
KARAOKE & KEY CONTROL
Spectrum Analizer
5k6
Rec
18k
330E
295mV
360mV
330mV
125mV
DOLBY-PROLOGIC
TUNER : 285mV
TAPE : 350mV
CD : 325mV
AUX : 120mV
VOLUME & SOUND CONTROL
For detailed info see separate Functional Diagram Chapter X-x
285mV
350mV
325mV
120mV
AUX : 90mV
Center
AUX : 90mV
Surround
Incredible Sound
x 1
12k
10k
Rear
Front
VOLUME & SOUND CONTROL
For detailed info see separate Functional Diagram Chapter X-x
350mV
240mV
230mV
220mV
x 11
15k
150k
TUNER : 2,5V
TAPE : 3,1V
CD : 2,7V
AUX : 2,7V
POWERSTAGE
Output:
2 x 50W L&R
1 x 50W Center
1 x 25W Surround
For detailed info see separate Functional Diagram Chapter X-x
6E 18,3V
6E 18,3V
6E 18,3V
12E 18,3V

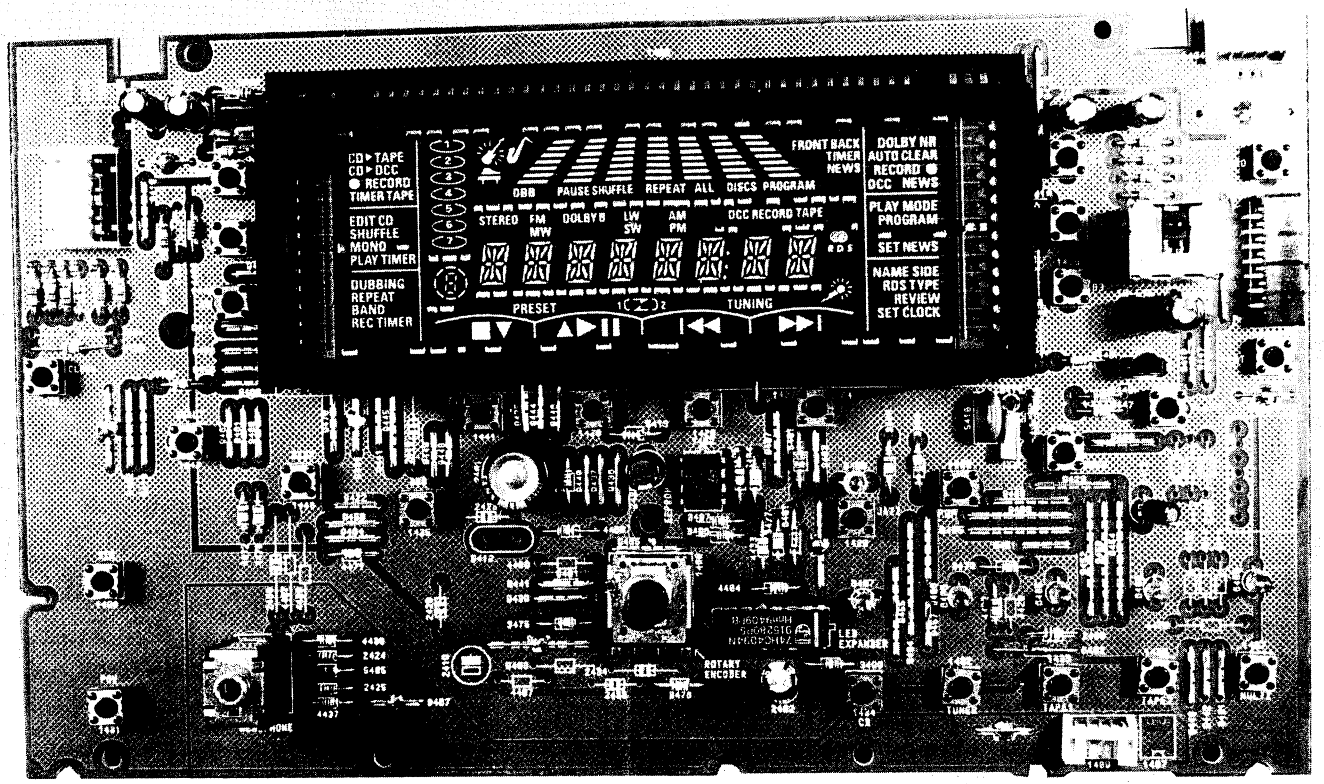
WIRING DIAGRAM


TRAFO
1315
1317
8301
3
8302
6
MAINS IN
STAND BY
1305
8050
5
POWER SUPPLY
/21 : 3104 217 04490
/22 : 3104 217 04380
/37 : 3104 217 04480
0006
0008
1306
1316
1309
1307
1301
1303
9
7
8002
8001
FAN
CONNECTION CIRCUIT
1313
1310
1311
1308
1324
1321
1319
3104 217 04390
2 CHANNEL POWER AMP.
1314
1312
0001
8303
3104 217 04380
SPEAKER PANEL
1357
1326
1358
1325
3104 217 04380
SPEAKER L
SPEAKER R
SURROUND L
SURROUND R
CENTER SPEAKER
8051
4
CENTER + SURROUND AMP.
1322
1320
1323
3104 217 04390
POWER MODULE
8053
6
IN/OUT
0004
8501
3
COMBI
/21 : 3103 308 61690
/22/37 : 3103 308 61520
1833
1829
1559
1831
1832
1828
1825
1562
1730
1720
1741
1742
1561
1835
1834
1750
1505
1553
8055
2
8054
9
8009
19
CDC7-MODULE
3103 308 51260
CDC ELECTRONIC
CDM 12.1
CD INTERFACE
1802
1801
8001
19
7
4
4
8504
2
CDC7 LIGHT
0007
3
CONTROL UNIT
1401
1409
1406
1411
1404
/21/37 : 3103 308 61680
/22 : 3103 308 61510
8010
15
8005
5
KARAOKE
1207
1206
3103 308 61670
8054
DOLBY PRO-LOGIC UNIT
1501
1510
1506
1508
3104 217 04370
8052
7
TUNER
1124
1121
/21/37 EC05 : 3103 308 09640
/22 TUNER 95 : 3104 217 04120
8003
4
8004
6
CDC KEYS
1405
3103 308 09070
8007
6
DECK 1 PLAYBACK
DECK 2 REC/PLAYBACK
3103 308 62870
13
11
8
▲ Only for /21 version
■ Not for /21 version
XH JST
JQ JST
PH JST
FE JST
DIPMATE
MOLEX

WIRING DIAGRAM FW670
3104 219 02460 bl. 130 - 01

LEU0131
9603

PCS 69 583


CD▸TAPE
CD▸DCC
● RECORD
TIMER TAPE
EDIT CD
SHUFFLE
MONO
PLAY TIMER
DUBBING
REPEAT
BAND
REC TIMER
DBB
PAUSE SHUFFLE
REPEAT
ALL
DISCS
PROGRAM
FRONT BACK
TIMER
NEWS
STEREO
FM
MW
DOLBY B
LW
SW
AM
PM
DCC RECORD TAPE
RDS
PRESET
TUNING
DOLBY NR
AUTO CLEAR
RECORD ●
DCC NEWS
PLAY MODE
PROGRAM
SET NEWS
NAME SIDE
RDS TYPE
REVIEW
SET CLOCK
ROTARY ENCODER
LED EXPANDER

CONTROL BOARD

TABLE OF CONTENTS

Component layout componentside view............................6-1
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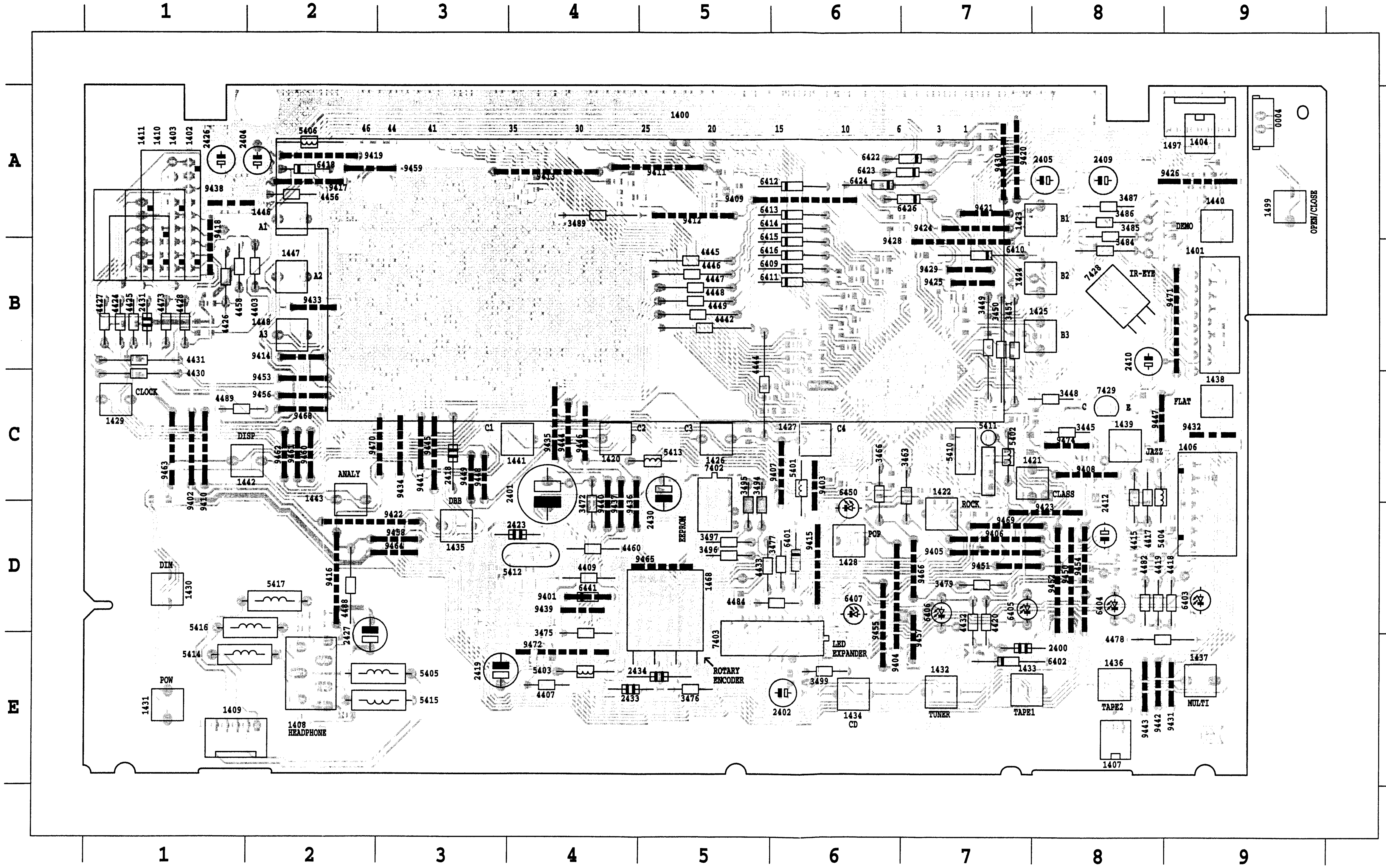
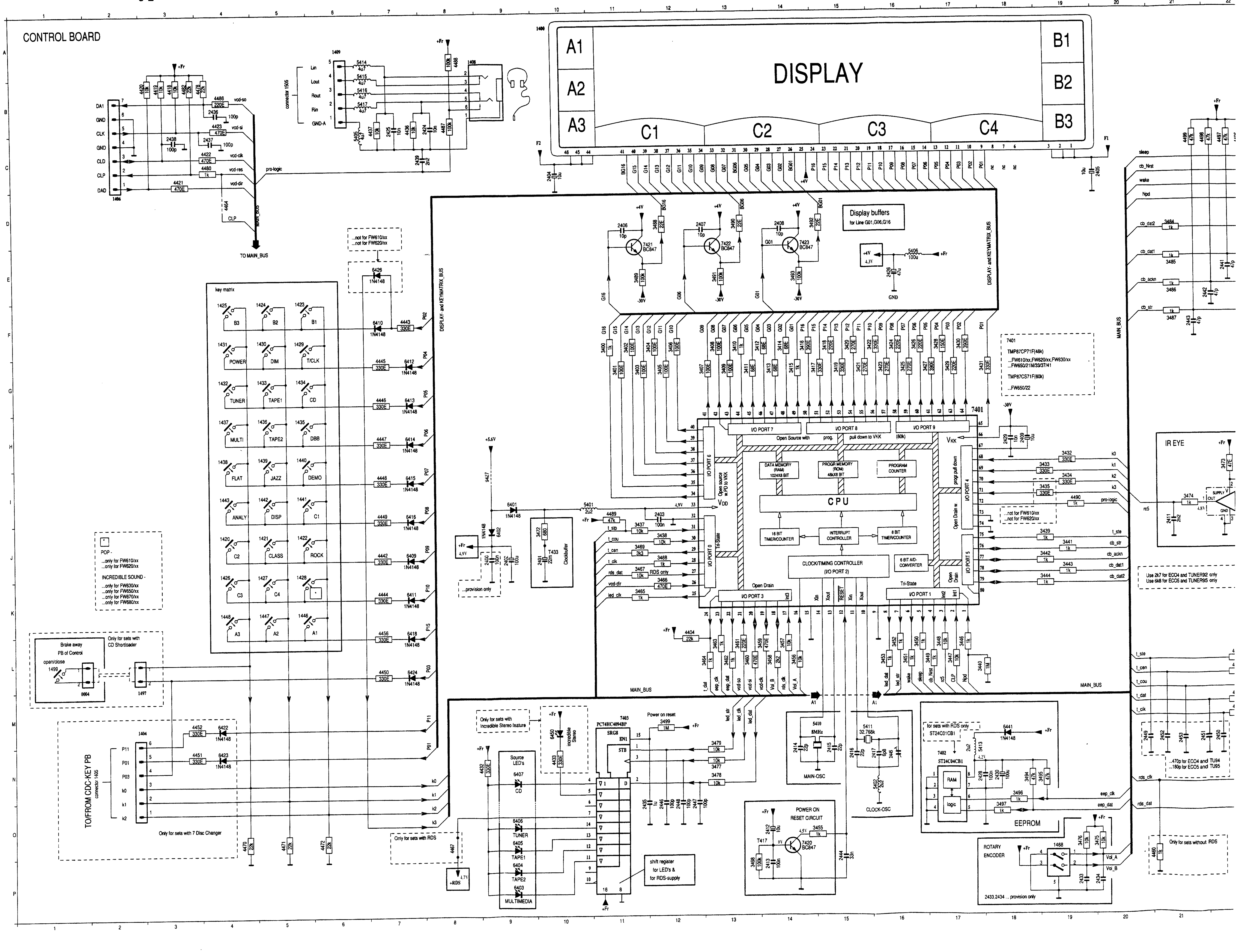
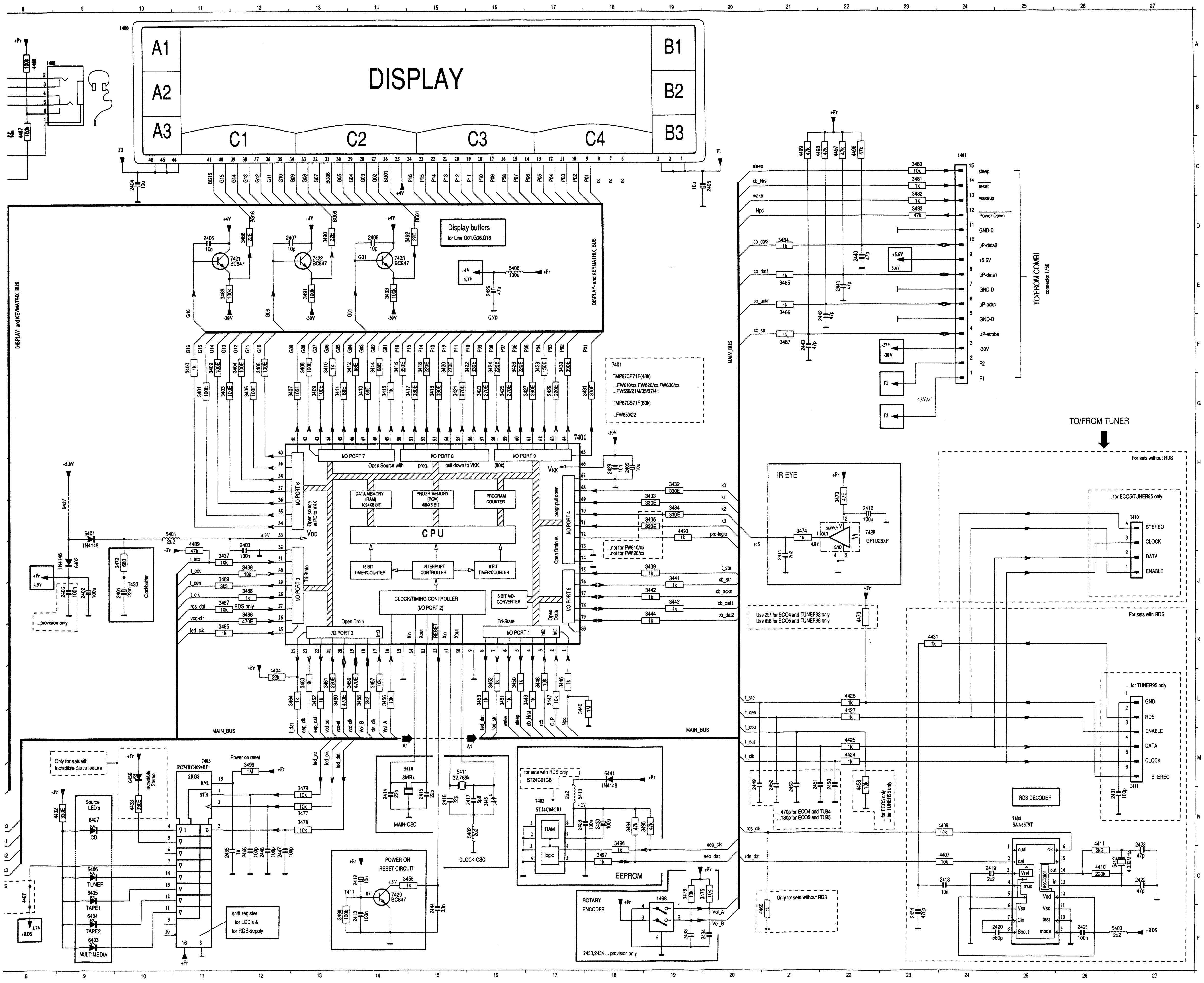
Component layout copperside view..................................6-3
CDC-keys 6-4
Partslist...6-4

COMPONENT LAYOUT COMPONENTSIDE VIEW


1
2
3
4
5
6
7
8
9
A
B
C
D
E
1400
CLOCK
DISP
ANALY
DBB
DIM
POW
HEADPHONE
EEPROM
ROTARY ENCODER
LED EXPANDER
CD
TUNER
TAPE1
TAPE2
MULTI
JAZZ
CLASS
ROCK
POP
FLAT
DEMO
IR-EYE
OPEN/CLOSE
A1
A2
A3
B1
B2
B3
C1
C2
C3
C4

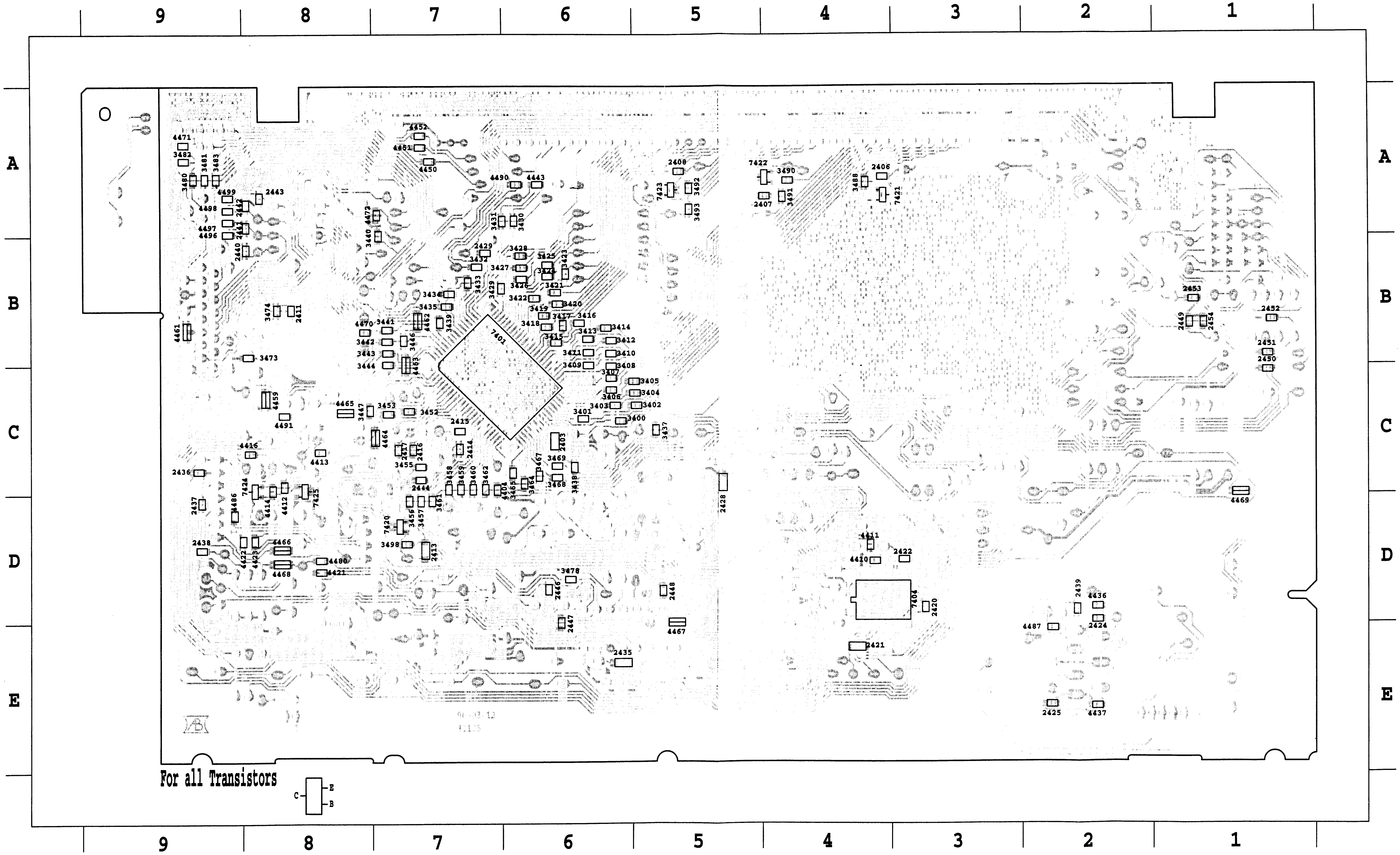
0004	A	9
1400	A	5
1401	B	9
1402	A	1
1403	A	1
1404	A	9
1406	D	9
1407	E	8
1408	E	2
1409	E	1
1410	B	1
1411	A	1
1420	C	4
1421	C	7
1422	D	7
1423	A	8
1424	B	8
1425	B	8
1426	C	5
1427	C	6
1428	D	6
1429	C	1
1430	D	1
1431	E	1
1432	E	7
1433	E	7
1434	E	6
1435	D	3
1436	E	8
1437	E	9
1438	C	9
1439	C	8
1440	A	9
1441	C	4
1442	C	2
1443	C	2
1446	A	2
1447	B	2
1448	B	2
1468	E	5
1497	A	9
1499	A	9
2400	E	7
2401	C	4
2402	E	6
2404	A	2
2405	A	8
2409	A	8
2410	B	8
2412	D	8
2418	C	3
2419	E	3
2423	D	4
2426	A	1
2427	E	2
2430	C	5
2431	B	1
2433	E	4
2434	E	5
3445	C	8
3448	C	8
3449	B	7
3450	B	7
3451	B	7
3463	C	7
3466	C	6
3472	D	4
3475	E	4
3476	E	5
3477	D	6
3479	D	7
3484	B	8
3485	A	8
3486	A	8
3487	A	8
3489	A	4
3494	D	5
3495	D	5
3496	D	5
3497	D	5
3499	E	6
4403	B	2
4407	E	4
4409	D	4
4415	C	8
4417	C	8
4418	D	9
4419	D	8
4420	D	7
4424	B	1
4425	B	1
4426	B	1
4427	B	1
4428	B	1
4430	C	1
4431	B	1
4432	D	7
4433	D	5
4442	B	5
4444	C	5
4445	B	5
4446	B	5
4447	B	5
4448	B	5
4449	B	5
4456	A	2
4458	B	1
4460	D	4
4473	B	1
4478	E	8
4482	D	8
4484	D	6
4488	D	2
4489	C	1
5401	C	6
5402	C	7
5403	E	4
5404	C	8
5405	E	3
5406	A	2
5410	C	7
5411	C	7
5412	D	4
5413	C	5
5414	E	1
5415	E	3
5416	D	2
5417	D	2
6401	D	6
6402	E	7
6403	D	9
6404	D	8
6405	D	7
6406	D	7
6407	D	6
6409	B	6
6410	B	7
6411	B	6
6412	A	6
6413	A	6
6414	A	6
6415	B	6
6416	B	6
6418	A	2
6422	A	7
6423	A	7
6424	A	6
6426	A	7
6441	D	4
6450	D	6
7402	D	5
7403	E	6
7428	B	8
7429	C	8
9401	D	4
9402	C	1
9403	C	6
9404	D	6
9405	D	7
9406	D	7
9407	C	6
9408	C	8
9409	A	6
9410	C	1
9411	A	5
9412	A	5
9413	A	4
9414	B	2
9415	D	6
9416	D	2
9417	A	2
9418	B	1
9419	A	2
9420	A	7
9421	A	7
9422	D	2
9423	D	8
9424	A	7
9425	B	7
9426	A	9
9428	B	7
9429	B	7
9430	A	7
9431	E	9
9432	C	9
9433	B	2
9434	C	3
9435	C	4
9436	D	4
9437	D	4
9438	A	1
9439	D	4
9440	D	4
9441	C	3
9442	E	8
9443	E	8
9444	C	4
9445	C	3
9446	C	4
9447	C	8
9448	C	3
9449	C	3
9450	D	8
9451	D	7
9452	D	8
9453	C	2
9454	D	8
9455	D	6
9456	C	2
9457	E	7
9458	D	3
9459	A	2
9460	C	2
9461	C	2
9462	C	2
9463	C	1
9464	D	3
9465	D	5
9466	D	7
9468	C	2
9469	D	7
9470	C	3
9471	B	9
9472	E	4
9474	C	8


CONTROL BOARD
DISPLAY
A1
A2
A3
B1
B2
B3
C1
C2
C3
C4
1400
Display buffers
for Line G01,G06,G16
7421 BC847
7422 BC847
7423 BC847
DISPLAY- and KEYMATRIX_BUS
key matrix
B3
B2
B1
POWER
DIM
T/CLK
TUNER
TAPE1
CD
MULTI
TAPE2
DBB
FLAT
JAZZ
DEMO
ANALY
DISP
C1
C2
CLASS
ROCK
C3
C4
A3
A2
A1
DA1
GND
CLK
GND
CLD
CLP
DAD
1406
vcd-so
vcd-si
vcd-clk
vcd-res
vcd-dir
pro-logic
CLP
MAIN_BUS
TO MAIN_BUS
connector 1505
Lin
Lout
Rout
Rin
GND-A
1409
1408
...not for FW610/xx
...not for FW620/xx
POP -
...only for FW610/xx
...only for FW620/xx
INCREDIBLE SOUND -
...only for FW630/xx
...only for FW650/xx
...only for FW670/xx
...only for FW680/xx
Brake away
PB of Control
open/close
1499
Only for sets with
CD Shortloader
1497
TO/FROM CDC-KEY PB
connector 1405
1404
P11
P01
P03
k0
k1
k2
Only for sets with 7 Disc Changer
Clockbuffer
...provision only
7401
TMP87CP71F(48k)
...FW610/xx,FW620/xx,FW630/xx
...FW650/21M/33/37/41
TMP87CS71F(60k)
...FW650/22
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 0
I/O PORT 5
I/O PORT 3
I/O PORT 1
Open Source with prog. pull down to VKK
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Drain
Tri-State
VDD
VKK
RDS only
MAIN_BUS
Only for sets with Incredible Stereo feature
Source LED's
CD
TUNER
TAPE1
TAPE2
MULTIMEDIA
incredible Stereo
PC74HC4094BP
7403
SRG8
Power on reset
shift register for LED's & for RDS-supply
Only for sets with RDS
+RDS
MAIN-OSC
8MHz
32.768k
CLOCK-OSC
POWER ON RESET CIRCUIT
7420 BC847
for sets with RDS only
ST24C01CB1
7402
ST24C04CB1
RAM
logic
EEPROM
ROTARY ENCODER
1468
2433,2434 ... provision only
Vol_A
Vol_B
eep_clk
eep_dat
IR EYE
Use 2k7 for ECO4 and TUNER92 only
Use 6k8 for ECO5 and TUNER95 only
...470p for ECO4 and TU94
...180p for ECO5 and TU95
Only for sets without RDS
sleep
cb_Nrst
wake
Npd
cb_dat2
cb_dat1
cb_ackn
cb_str
t_ste
t_cen
t_cou
t_dat
t_clk
rds_clk
rds_dat


DISPLAY
A1
A2
A3
B1
B2
B3
C1
C2
C3
C4
1400
Display buffers
for Line G01,G06,G16
7421 BC847
7422 BC847
7423 BC847
DISPLAY- and KEYMATRIX_BUS
MAIN_BUS
7401
TMP87CP71F(48k)
..FW610/xx,FW620/xx,FW630/xx
..FW650/21M/33/37/41
TMP87CS71F(60k)
..FW650/22
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 5
I/O PORT 0
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48kX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Source with prog. pull down to VKK (80k)
Open Drain
Tri-State
...not for FW610/xx
...not for FW620/xx
Clockbuffer
...provision only
Only for sets with Incredible Stereo feature
Source LED's
CD
TUNER
TAPE1
TAPE2
MULTIMEDIA
PC74HC4094BP
7403
SRG8
Power on reset
shift register for LED's & for RDS-supply
MAIN-OSC
8MHz
32.768k
CLOCK-OSC
POWER ON RESET CIRCUIT
7420 BC847
for sets with RDS only
ST24C01CB1
7402
ST24C04CB1
RAM
logic
EEPROM
ROTARY ENCODER
2433,2434 ... provision only
IR EYE
7428
GP1U28XP
Use 2l:7 for ECO4 and TUNER92 only
Use 6:8 for ECO5 and TUNER95 only
1401
sleep
reset
wakeup
Power-Down
GND-D
uP-data2
+5,6V
uP-data1
uP-ackn
uP-strobe
-30V
F2
F1
TO/FROM COMBI
connector 1750
TO/FROM TUNER
For sets without RDS
... for ECO5/TUNER95 only
1410
STEREO
CLOCK
DATA
ENABLE
For sets with RDS
... for TUNER95 only
1411
GND
RDS
ENABLE
DATA
CLOCK
STEREO
RDS DECODER
7404
SAA6579T
...470p for ECO4 and TU94
...180p for ECO5 and TU95
for ECO5 only for TUNER95 only
Only for sets without RDS
4.332MHz

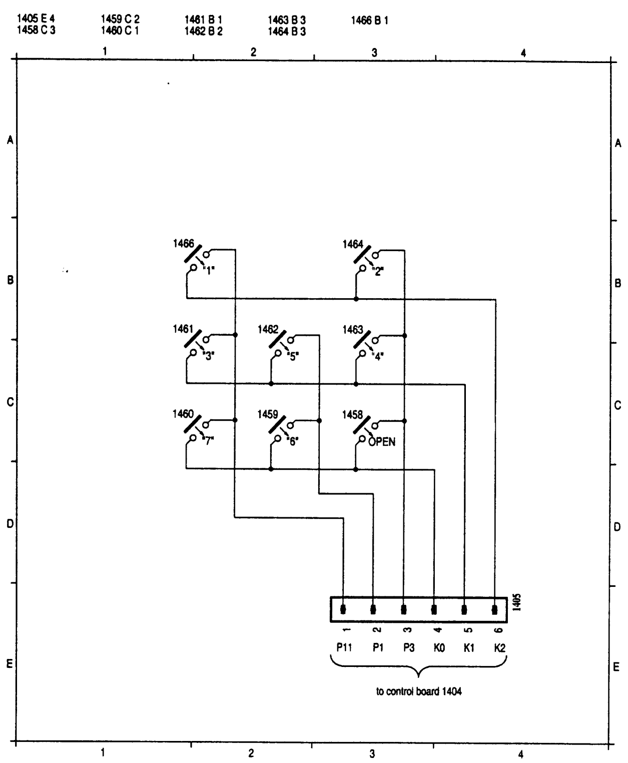
0004	L 1
1400	A10
1401	C24
1402	K25
1403	H25
1404	M 3
1406	D 2
1408	A 8
1409	A 6
1410	I27
1411	N27
1420	J 4
1421	J 5
1422	J 5
1423	F 5
1424	F 5
1425	F 4
1426	J 4
1427	J 5
1428	J 5
1429	F 5
1430	F 5
1431	F 4
1432	G 4
1433	G 5
1434	G 5
1435	H 5
1436	H 5
1437	H 4
1438	H 4
1439	H 5
1440	H 5
1441	I 5
1442	I 5
1443	I 4
1446	K 5
1447	K 5
1448	K 4
1468	O19
1497	L 3
1499	L 1
2400	J 9
2401	J10
2402	J 9
2403	I12
2404	C10
2405	C20
2406	D11
2407	D13
2408	D14
2409	H18
2410	I22
2411	J21
2412	O14
2413	P14
2414	N14
2415	N15
2416	N15
2417	N16
2418	O24
2419	O24
2420	P25
2421	P26
2422	O27
2423	O27
2424	B 8
2425	B 7
2426	E16
2428	N17
2429	H18
2430	N18
2431	N26
2433	P19
2434	P20
2435	O11
2436	B 4
2437	C 4
2438	C 3
2439	C 7
2440	E22
2441	E22
2442	F22
2443	F21
2444	P15
2445	N16
2446	O12
2447	O12
2448	O12
2449	M20
2450	M22
2451	M21
2452	M21
2453	M21
2454	P23
3400	F11
3401	G11
3402	F11
3403	G11
3404	F12
3405	G12
3406	F12
3407	G13
3408	F13
3409	G13
3410	F13
3411	G13
3412	F14
3413	G14
3414	F14
3415	G14
3416	F14
3417	G15
3418	F15
3419	G15
3420	F15
3421	G15
3422	F16
3423	G16
3424	F16
3425	G16
3426	F16
3427	G17
3428	F17
3429	G17
3430	F17
3431	G18
3432	H19
3433	I19
3434	I19
3435	I19
3437	J11
3438	J12
3439	J19
3440	L17
3441	J19
3442	J19
3443	J19
3444	K19
3445	L18
3446	L17
3447	L17
3448	L17
3449	L17
3450	L16
3451	L16
3452	L16
3453	L16
3455	O15
3456	L14
3457	L14
3458	L14
3459	L14
3460	L13
3461	L13
3462	L13
3463	L13
3464	L13
3465	K11
3466	K12
3467	J11
3468	J12
3469	J11
3472	J10
3473	I22
3474	I21
3475	O20
3476	O19
3477	N13
3478	N13
3479	N13
3480	C23
3481	C23
3482	C23
3483	D23
3484	D21
3485	E21
3486	E21
3487	F21
3488	D12
3489	E11
3490	D13
3491	E13
3492	D15
3493	E14
3494	N18
3495	N19
3496	N18
3497	O18
3498	P13
3499	M12
4403	G24
4404	L12
4407	O24
4409	N24
4410	O26
4411	N26
4418	B 3
4419	B 3
4420	B 3
4421	C 3
4422	C 4
4423	B 4
4424	M22
4425	M22
4426	L23
4427	L22
4428	L22
4430	K23
4431	K23
4432	N 9
4433	N10
4436	B 7
4437	B 7
4442	J 7
4443	F 7
4444	K 7
4445	G 7
4446	G 7
4447	H 7
4448	I 7
4449	I 7
4450	L 7
4451	N 3
4452	M 3
4456	K 7
4458	M22
4460	P21
4464	D 4
4470	O 4
4471	O 5
4472	O 6
4473	K22
4478	B 4
4480	C 4
4482	B 3
4484	L 9
4486	B 4
4487	B 8
4488	A 8
4489	I11
4490	I19
4491	I 9
4496	C22
4497	C22
4498	C22
4499	C21
5401	I10
5402	N16
5403	P27
5405	C 6
5406	E16
5410	M15
5411	M15
5412	O27
5413	N17
5414	A 7
5415	A 7
5416	B 7
5417	B 7
6401	I 9
6402	J 9
6403	P 9
6404	P 9
6405	O 9
6406	O 9
6407	N 9
6409	J 7
6410	F 7
6411	K 7
6412	G 7
6413	G 7
6414	H 7
6415	I 7
6416	I 7
6418	L 7
6422	M 4
6423	N 4
6424	L 7
6426	E 7
6441	M18
6450	M10
7401	H18
7402	N17
7403	M11
7404	N25
7420	O14
7421	E11
7422	E13
7423	E14
7428	I22
7429	I 9
9401	M18

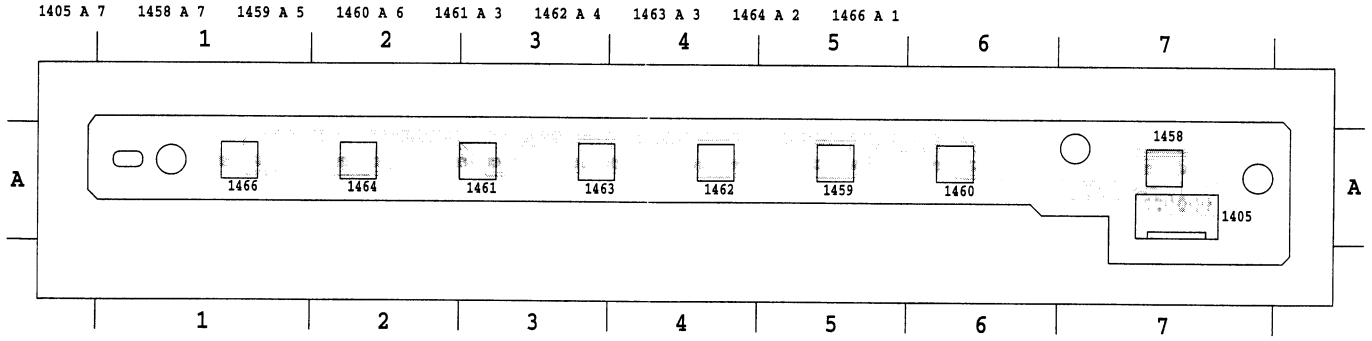
COMPONENT LAYOUT COPPERSIDE VIEW


9
8
7
6
5
4
3
2
1
A
B
C
D
E
7401
7404
7420
7421
7422
7423
7424
7425
For all Transistors
C
E
B

2403	C	6
2406	A	4
2407	A	4
2408	A	5
2411	B	8
2413	D	7
2414	C	7
2415	C	7
2416	C	7
2417	C	7
2420	D	3
2421	E	4
2422	D	3
2424	D	2
2425	E	2
2428	C	5
2429	B	7
2435	E	6
2436	C	9
2437	D	9
2438	D	9
2439	D	2
2440	B	8
2441	A	8
2442	A	8
2443	A	8
2444	C	7
2446	D	6
2447	D	6
2448	D	5
2449	B	1
2450	C	1
2451	B	1
2452	B	1
2453	B	1
2454	B	1
3400	C	6
3401	C	6
3402	C	5
3403	C	6
3404	C	5
3405	C	5
3406	C	6
3407	C	6
3408	C	6
3409	B	6
3410	B	6
3411	B	6
3412	B	6
3413	B	6
3414	B	6
3415	B	6
3416	B	6
3417	B	6
3418	B	6
3419	B	6
3420	B	6
3421	B	6
3422	B	6
3423	B	6
3424	B	6
3425	B	6
3426	B	6
3427	B	6

CDC-KEYS





ELECTRICAL PARTSLIST CDC-KEYS

MISCELLANEOUS

1458	4822 276 13114	TACT SWITCH
1459	4822 276 13114	TACT SWITCH
1460	4822 276 13114	TACT SWITCH
1461	4822 276 13114	TACT SWITCH
1462	4822 276 13114	TACT SWITCH
1463	4822 276 13114	TACT SWITCH
1464	4822 276 13114	TACT SWITCH
1466	4822 276 13114	TACT SWITCH

ELECTRICAL PARTSLIST CONTROL BOARD

MISCELLANEOUS

1400	4822 135 00025	DISPLAY
1408	4822 267 31506	PHONE SOCKET
1420	4822 276 13114	TACT SWITCH
1421	4822 276 13114	TACT SWITCH
1422	4822 276 13114	TACT SWITCH
1423	4822 276 13114	TACT SWITCH
1424	4822 276 13114	TACT SWITCH
1425	4822 276 13114	TACT SWITCH
1426	4822 276 13114	TACT SWITCH
1427	4822 276 13114	TACT SWITCH
1428	4822 276 13114	TACT SWITCH
1429	4822 276 13114	TACT SWITCH
1430	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH
1435	4822 276 13114	TACT SWITCH
1436	4822 276 13114	TACT SWITCH
1437	4822 276 13114	TACT SWITCH
1438	4822 276 13114	TACT SWITCH
1439	4822 276 13114	TACT SWITCH
1440	4822 276 13114	TACT SWITCH
1441	4822 276 13114	TACT SWITCH
1442	4822 276 13114	TACT SWITCH
1443	4822 276 13114	TACT SWITCH
1446	4822 276 13114	TACT SWITCH
1447	4822 276 13114	TACT SWITCH
1448	4822 276 13114	TACT SWITCH
1468	4822 101 21261	ROTARY ENCODER

CAPACITORS

2401	4822 124 80818	22M 5,5V
2402	4822 124 41584	100UF 20% 10V
2403	4822 122 33496	100NF10%X7R 63V
2404	4822 124 41579	10UF 20% 50V
2405	4822 124 41579	10UF 20% 50V
2406	5322 122 32448	10PF 5% 50V
2407	5322 122 32448	10PF 5% 50V
2408	5322 122 32448	10PF 5% 50V
2409	4822 124 41579	10UF 20% 50V
2410	4822 124 41584	100UF 20% 10V
2411	4822 122 33175	2,2NF 20% X7R 50V
2412	4822 124 22403	10UF 20% 16V
2413	4822 122 33496	100NF10%X7R 63V
2414	5322 122 32658	22PF 5% 50V
2415	5322 122 32658	22PF 5% 50V
2416	5322 122 32658	22PF 5% 50V
2417	5322 122 32269	6,8PF 5% 50V
2418	4822 121 51387	10NF20% 16V
2419	4822 124 41576	2,2UF 20% 50V
2420	5322 122 34099	470PF10%X7R 63V

CAPACITORS

2421	4822 122 33496	100NF10%X7R 63V
2422	5322 122 32452	47PF 5%NP0 63V
2423	4822 122 33848	47PF 5%SL 50V
2424	4822 122 33177	10NF 20% X7R 50V
2425	4822 122 33177	10NF 20% X7R 50V
2426	4822 124 40433	47UF20% 25V
2428	4822 122 33496	100NF10%X7R 63V
2429	4822 122 33177	10NF 20% X7R 50V
2430	4822 124 42234	100UF 20% 6,3V
2431	4822 122 33195	100PF 10% 50V
2439	4822 122 33194	2,2NF 20% 16V
2435	4822 126 11692	1UF
2436	5322 122 32531	100PF 5%NP0 50V
2437	5322 122 32531	100PF 5%NP0 50V
2438	5322 122 32531	100PF 5%NP0 50V
2439	4822 122 33194	2,2NF 20% 16V
2440	5322 122 32452	47PF 5%NP0 63V
2441	5322 122 32452	47PF 5%NP0 63V
2442	5322 122 32452	47PF 5%NP0 63V
2443	5322 122 32452	47PF 5%NP0 63V
2444	4822 122 33342	33NF10%X7R 63V
2446	5322 122 32531	100PF 5%NP0 50V
2447	5322 122 32531	100PF 5%NP0 50V
2448	5322 122 32531	100PF 5%NP0 50V
2450	4822 126 10326	180PF 5%NP0 63V
2451	4822 126 10326	180PF 5%NP0 63V
2453	5322 122 34099	470PF10%X7R 63V
2454	5322 122 34099	470PF10%X7R 63V

RESISTORS

3400	4822 051 10102	1K00 2% 0,25W
3401	4822 051 20101	100R00 5% 0,1W
3402	4822 051 20101	100R00 5% 0,1W
3403	4822 051 20101	100R00 5% 0,1W
3404	4822 051 20101	100R00 5% 0,1W
3405	4822 051 20101	100R00 5% 0,1W
3406	4822 051 20101	100R00 5% 0,1W
3407	4822 051 20101	100R00 5% 0,1W
3408	4822 051 20101	100R00 5% 0,1W
3409	4822 051 20101	100R00 5% 0,1W
3410	4822 051 10102	1K00 2% 0,25W
3411	4822 051 20689	68R00 5% 0,1W
3412	4822 051 20689	68R00 5% 0,1W
3413	4822 051 20689	68R00 5% 0,1W
3414	4822 051 20689	68R00 5% 0,1W
3415	4822 051 10102	1K00 2% 0,25W
3416	4822 051 20391	390R00 5% 0,1W
3417	4822 051 20331	330R00 5% 0,1W
3418	4822 051 20221	220R00 5% 0,1W
3419	4822 051 20331	330R00 5% 0,1W
3420	4822 051 20271	270R00 5% 0,1W
3421	4822 051 20271	270R00 5% 0,1W
3422	4822 051 20331	330R00 5% 0,1W
3423	4822 051 20271	270R00 5% 0,1W

ELECTRICAL PARTSLIST CONTROL BOARD

RESISTORS

3424	4822 051 20221	220R00	5%	0,1W
3425	4822 051 20271	270R00	5%	0,1W
3426	4822 051 20221	220R00	5%	0,1W
3427	4822 051 20391	390R00	5%	0,1W
3428	4822 117 10353	150R	1%	0,1W
3429	4822 051 20221	220R00	5%	0,1W
3430	4822 051 20391	390R00	5%	0,1W
3431	4822 051 20331	330R00	5%	0,1W
3432	4822 051 20331	330R00	5%	0,1W
3433	4822 051 20331	330R00	5%	0,1W
3434	4822 051 20331	330R00	5%	0,1W
3435	4822 051 20331	330R00	5%	0,1W
3437	4822 051 20103	10K00	5%	0,1W
3438	4822 051 20103	10K00	5%	0,1W
3439	4822 051 10102	1K00	2%	0,25W
3440	4822 051 20105	1M00	5%	0,1W
3441	4822 051 10102	1K00	2%	0,25W
3442	4822 051 10102	1K00	2%	0,25W
3443	4822 051 10102	1K00	2%	0,25W
3444	4822 051 10102	1K00	2%	0,25W
3445	4822 051 10102	1K00	2%	0,25W
3446	4822 051 10102	1K00	2%	0,25W
3447	4822 051 10102	1K00	2%	0,25W
3448	4822 116 83864	10K	5%	0,5W
3449	4822 050 11002	1K00	1%	0,4W
3450	4822 050 11002	1K00	1%	0,4W
3451	4822 050 11002	1K00	1%	0,4W
3452	4822 051 10102	1K00	2%	0,25W
3453	4822 051 10102	1K00	2%	0,25W
3455	4822 051 10102	1K00	2%	0,25W
3456	4822 051 20103	10K00	5%	0,1W
3457	4822 051 20103	10K00	5%	0,1W
3458	4822 051 20222	2K20	5%	0,1W
3459	4822 051 20471	470R00	5%	0,1W
3460	4822 051 20471	470R00	5%	0,1W
3461	4822 051 10102	1K00	2%	0,25W
3462	4822 051 10102	1K00	2%	0,25W
3463	4822 050 11002	1K00	1%	0,4W
3464	4822 051 10102	1K00	2%	0,25W
3465	4822 051 10102	1K00	2%	0,25W
3466	4822 116 52224	470E	5%	0,5W
3467	4822 051 20103	10K00	5%	0,1W
3468	4822 051 10102	1K00	2%	0,25W
3469	4822 051 20332	3K30	5%	0,1W
3472	4822 116 52228	680E	5%	0,5W
3473	4822 051 20479	47R00	5%	0,1W
3474	4822 051 10102	1K00	2%	0,25W
3475	4822 116 83864	10K	5%	0,5W
3476	4822 116 83864	10K	5%	0,5W
3477	4822 116 83864	10K	5%	0,5W
3478	4822 051 20103	10K00	5%	0,1W
3479	4822 116 83864	10K	5%	0,5W
3480	4822 051 20103	10K00	5%	0,1W
3481	4822 051 10102	1K00	2%	0,25W
3482	4822 051 10102	1K00	2%	0,25W

RESISTORS

3483	4822 051 20473	47K00	5%	0,1W
3484	4822 050 11002	1K00	1%	0,4W
3485	4822 050 11002	1K00	1%	0,4W
3486	4822 050 11002	1K00	1%	0,4W
3487	4822 050 11002	1K00	1%	0,4W
3488	4822 051 20229	22R00	5%	0,1W
3489	4822 116 52234	100K	5%	0,5W
3490	4822 051 20229	22R00	5%	0,1W
3491	4822 051 20104	100K00	5%	0,1W
3492	4822 051 20229	22R00	5%	0,1W
3493	4822 051 20104	100K00	5%	0,1W
3494	4822 116 52284	47K	5%	0,5W
3495	4822 116 52284	47K	5%	0,5W
3496	4822 050 11002	1K00	1%	0,4W
3497	4822 050 11002	1K00	1%	0,4W
3498	4822 051 20104	100K00	5%	0,1W
3499	4822 116 52235	1M	5%	0,5W
4404	4822 051 20223	22K00	5%	0,1W
4407	4822 116 83864	10K	5%	0,5W
4409	4822 116 83864	10K	5%	0,5W
4410	4822 051 20224	220K00	5%	0,1W
4411	4822 051 20222	2K20	5%	0,1W
4418	4822 116 83864	10K	5%	0,5W
4419	4822 116 83864	10K	5%	0,5W
4420	4822 116 83864	10K	5%	0,5W
4421	4822 051 20471	470R00	5%	0,1W
4422	4822 051 20471	470R00	5%	0,1W
4423	4822 051 20471	470R00	5%	0,1W
4424	4822 050 11002	1K00	1%	0,4W
4425	4822 050 11002	1K00	1%	0,4W
4426	4822 050 11002	1K00	1%	0,4W
4427	4822 050 11002	1K00	1%	0,4W
4428	4822 050 11002	1K00	1%	0,4W
4430	4822 050 11002	1K00	1%	0,4W
4431	4822 050 11002	1K00	1%	0,4W
4432	4822 116 52219	330E	5%	0,5W
4433	4822 116 52219	330E	5%	0,5W
4436	4822 051 20103	10K00	5%	0,1W
4437	4822 051 20103	10K00	5%	0,1W
4442	4822 116 52219	330E	5%	0,5W
4443	4822 051 20331	330R00	5%	0,1W
4444	4822 116 52219	330E	5%	0,5W
4445	4822 116 52219	330E	5%	0,5W
4446	4822 116 52219	330E	5%	0,5W
4447	4822 116 52219	330E	5%	0,5W
4448	4822 116 52219	330E	5%	0,5W
4449	4822 116 52219	330E	5%	0,5W
4450	4822 051 20331	330R00	5%	0,1W
4451	4822 051 20331	330R00	5%	0,1W
4452	4822 051 20331	330R00	5%	0,1W
4456	4822 116 52219	330E	5%	0,5W
4458	4822 116 83864	10K	5%	0,5W
4460	4822 050 11002	1K00	only for /21	

ELECTRICAL PARTSLIST CONTROL BOARD

RESISTORS

4461	4822 051 10008	0R00	5%	0,25W
4462	4822 051 10008	0R00	5%	0,25W
4463	4822 051 10008	0R00	5%	0,25W
4464	4822 051 10008	0R00	5%	0,25W
4465	4822 051 10008	0R00	5%	0,25W
4466	4822 051 10008	0R00	5%	0,25W
4467	4822 051 10008	0R00	5%	0,25W
4468	4822 051 10008	0R00	5%	0,25W
4470	4822 051 20223	22K00	5%	0,1W
4471	4822 051 20223	22K00	5%	0,1W
4472	4822 051 20223	22K00	5%	0,1W
4473	4822 116 52296	6K8	5%	0,5W
4478	4822 116 52257	22K	5%	0,5W
4480	4822 051 10102	1K00	2%	0,25W
4482	4822 116 52257	22K	5%	0,5W
4486	4822 051 10102	1K00	2%	0,25W
4487	4822 116 52271	33K	5%	0,5W
4488	4822 116 52285	470K	5%	0,5W
4489	4822 116 52284	47K	5%	0,5W
4490	4822 051 10102	1K00	2%	0,25W
4491	4822 051 10102	1K00	2%	0,25W
4496	4822 051 20473	47K00	5%	0,1W
4497	4822 051 20473	47K00	5%	0,1W
4498	4822 051 20473	47K00	5%	0,1W
4499	4822 051 20473	47K00	5%	0,1W

COILS

5401	4822 157 62552	2,2UH
5402	4822 157 62552	2,2UH
5403	4822 157 62552	2,2UH
5405	4822 157 62552	2,2UH
5406	4822 157 52333	100UH
5410	5322 242 73697	CER.RES. 8MHz
5411	4822 242 70938	XTAL 32,768KHZ
5412	4822 242 72195	XTAL 4,332MHz
5413	4822 157 62552	2,2UH
5414	4822 157 53139	4,7UH
5415	4822 157 53139	4,7UH
5416	4822 157 53139	4,7UH
5417	4822 157 53139	4,7UH

DIODES

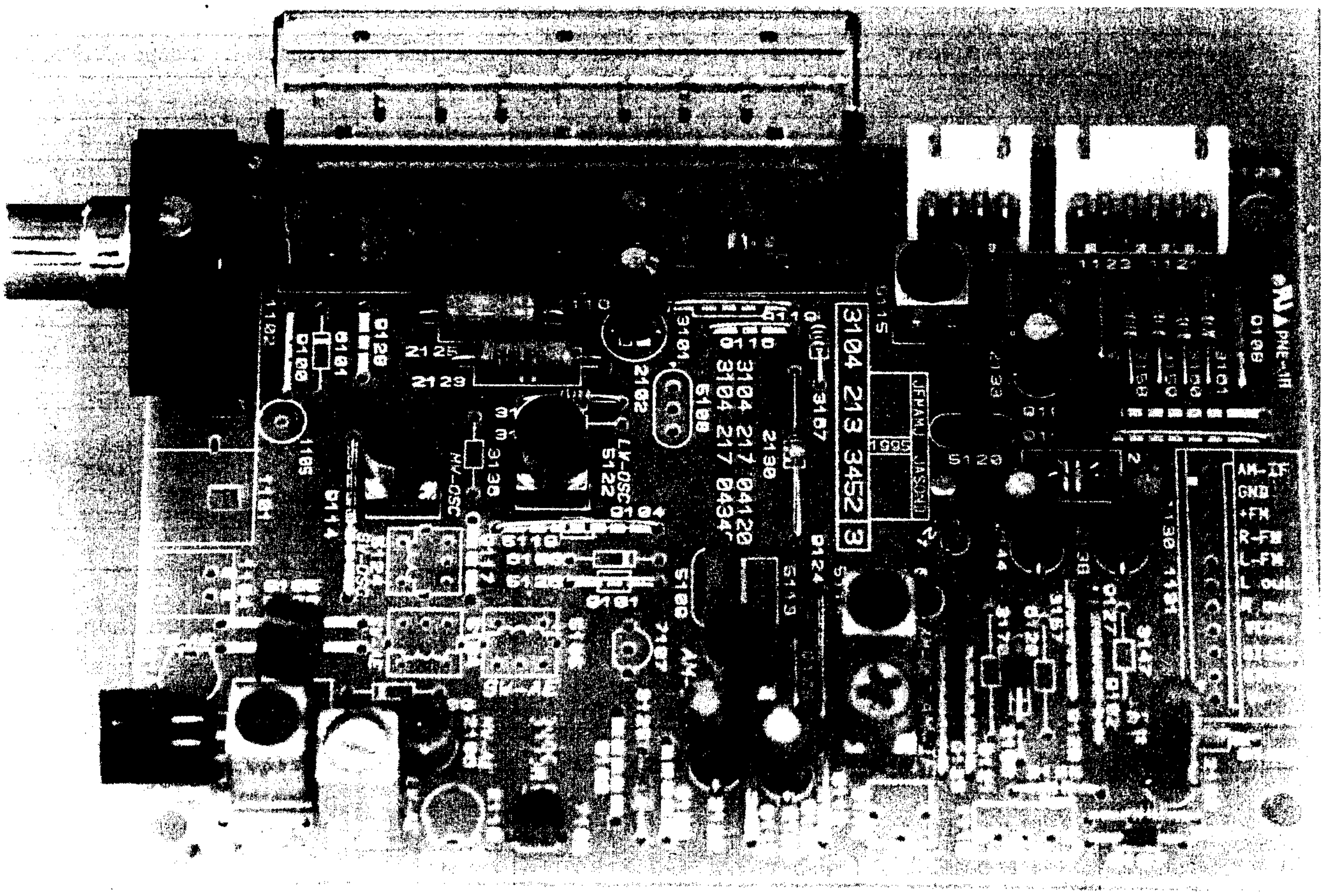
6401	4822 130 30621	1N4148 (COL)
6402	4822 130 30621	1N4148 (COL)
6403	4822 130 82978	LED LTL-16KPE
6404	4822 130 82978	LED LTL-16KPE
6405	4822 130 82978	LED LTL-16KPE
6406	4822 130 82978	LED LTL-16KPE
6407	4822 130 82978	LED LTL-16KPE
6409	4822 130 30621	1N4148 (COL)
6410	4822 130 30621	1N4148 (COL)
6411	4822 130 30621	1N4148 (COL)

DIODES

6412	4822 130 30621	1N4148 (COL)
6413	4822 130 30621	1N4148 (COL)
6414	4822 130 30621	1N4148 (COL)
6415	4822 130 30621	1N4148 (COL)
6416	4822 130 30621	1N4148 (COL)
6418	4822 130 30621	1N4148 (COL)
6422	4822 130 30621	1N4148 (COL)
6423	4822 130 30621	1N4148 (COL)
6424	4822 130 30621	1N4148 (COL)
6426	4822 130 30621	1N4148 (COL)
6441	4822 130 30621	1N4148 (COL)
6450	4822 130 82978	LED LTL-16KGE

TRANSISTORS & IC's

7401	4822 209 13036	TMP87CS71F
7402	4822 209 31508	ST24C01B1 only /22
7402	4822 209 52316	ST24C04B1 only /21
7403	5322 209 11532	74HC4094P
7404	4822 209 31981	SAA6579T/V1
7420	5322 130 42755	BC847C (UAW)
7421	5322 130 42755	BC847C (UAW)
7422	5322 130 42755	BC847C (UAW)
7423	5322 130 42755	BC847C (UAW)
7428	4822 130 10165	GP1U28XP
7429	5322 130 60068	BC558C


3104 213 3452 3
3104 217 04120
3104 217 0434
1995
JASON
MW-OSC
LW-OSC
AM-IF
GND
+FM
R-FM
L-FM
L out
2125
2129
2102
5122
1102
1104
1105
1123

TUNER 95

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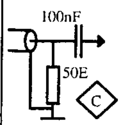
Component layout 7A-5
Partslist 7A-6

TUNER 95 Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	**Input frequency**	**Input**	**Set tuned to**	**Adjust**	**Output**	**Scope / Voltmeter**
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM - VCO						
FM	98 Mhz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 Mhz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM - IF						
MW	450kHz Δf = 10kHz low as possible swept signal		MW	5111	7	symmetrical and max. height ↕
				5112		
	450.0kHz continuous wave	C		5114	1 2	0mV ± 2mV
AM - RF						
MW	558kHz mod = 1kHz 30 % AM	B *	558kHz	5102	7	MAX ↕
	1494 kHz		1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM		198kHz	5103		MAX

Signal send via a frame antenna

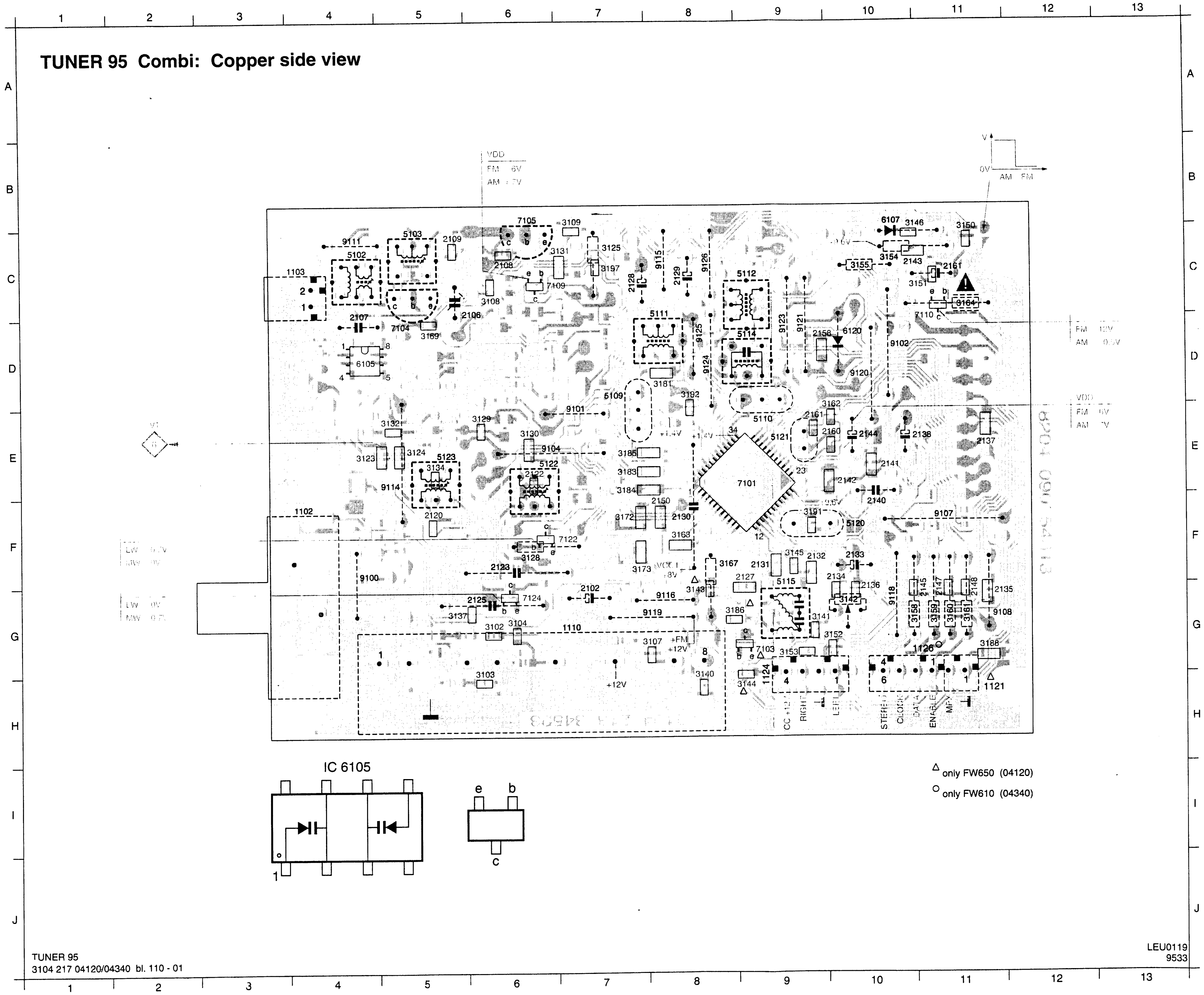
..) = tuning grid in kHz

↕ repeat

adjtable for 3104 217 04120/04340

1102	F4	2107	D4	2128	C7	2136	G10	2145	G11	3102	G6	3125	C7	3140	H8	3151	C10	3161	G11	3181	D8	3197	C7	5115	G9	7101	E9	9100	F4	9115	C8	9125	D8
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	3103	H6	3128	F6	3141	G9	3152	G9	3162	E9	3183	E7	5102	C4	5120	F10	7103	G9	9101	E7	9116	G8	9126	C8
1110	G7	2109	C5	2130	F8	2138	E10	2148	G11	3104	G6	3129	E6	3142	G10	3153	G9	3163	F8	3184	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10		
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3107	G7	3130	E6	3143	G8	3154	C10	3164	C11	3185	E7	5109	D7	5122	E6	7105	B6	9104	E6	9119	G7		
1124	H9	2122	E6	2132	F9	2141	E10	2158	D9	3108	C6	3131	C6	3144	H8	3155	C10	3167	F8	3186	G8	5110	E9	5123	E5	7109	C6	9107	F11	9120	D10		
1126	G10	2123	F6	2133	F10	2142	E10	2160	E9	3109	B7	3132	E5	3145	F9	3158	G10	3169	D5	3188	G11	5111	C8	6105	D4	7110	D11	9108	G11	9121	D9		
2102	G7	2125	G5	2134	F9	2143	C10	2161	E9	3123	E4	3134	E5	3146	B10	3159	G11	3172	F7	3191	F9	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9		
2106	C5	2127	F8	2135	G11	2144	E10	2161	C11	3124	E5	3137	G5	3150	C11	3160	G11	3173	F7	3192	D8	5114	D9	6120	D10	7124	G6	9114	E5	9124	D8		

TUNER 95 Combi: Copper side view


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
VDD
FM 6V
AM 7V
V
0V
AM FM
FM 12V
AM 0.5V
VDD
FM 6V
AM 7V
LW 6V
MW 0V
LW 0V
MW 6V
1103
1102
9111
5102
5103
2109
7105
3109
3125
3131
3197
7109
2108
3108
2107
7104
3169
2106
6105
1
4
8
5
9115
9126
2128
2129
5111
5112
5114
9121
9123
9125
9124
3181
3192
9101
5109
5110
6107
3146
3160
3155
3154
2143
2161
3151
7110
9164
2158
6120
9102
9120
3132
3123
3124
5123
3134
9114
3129
3130
9104
5122
2122
3185
3183
3184
2150
2130
3172
3163
3173
7101
34
23
12
5121
3162
2161
2160
2144
2138
2137
2142
2141
2140
3191
5120
9107
1102
2120
7122
3128
2123
9100
2125
7124
3137
2102
9116
9119
3102
3104
1110
3103
3107
+FM
+12V
+12V
3140
3148
3167
2131
3145
2132
2133
2127
5115
2134
2136
3142
3141
3186
3152
7103
3153
3144
1124
9118
3158
3159
3160
3161
2145
2147
2148
2135
9108
3188
1126
1121
CC +12
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
IC 6105
1
e
b
c

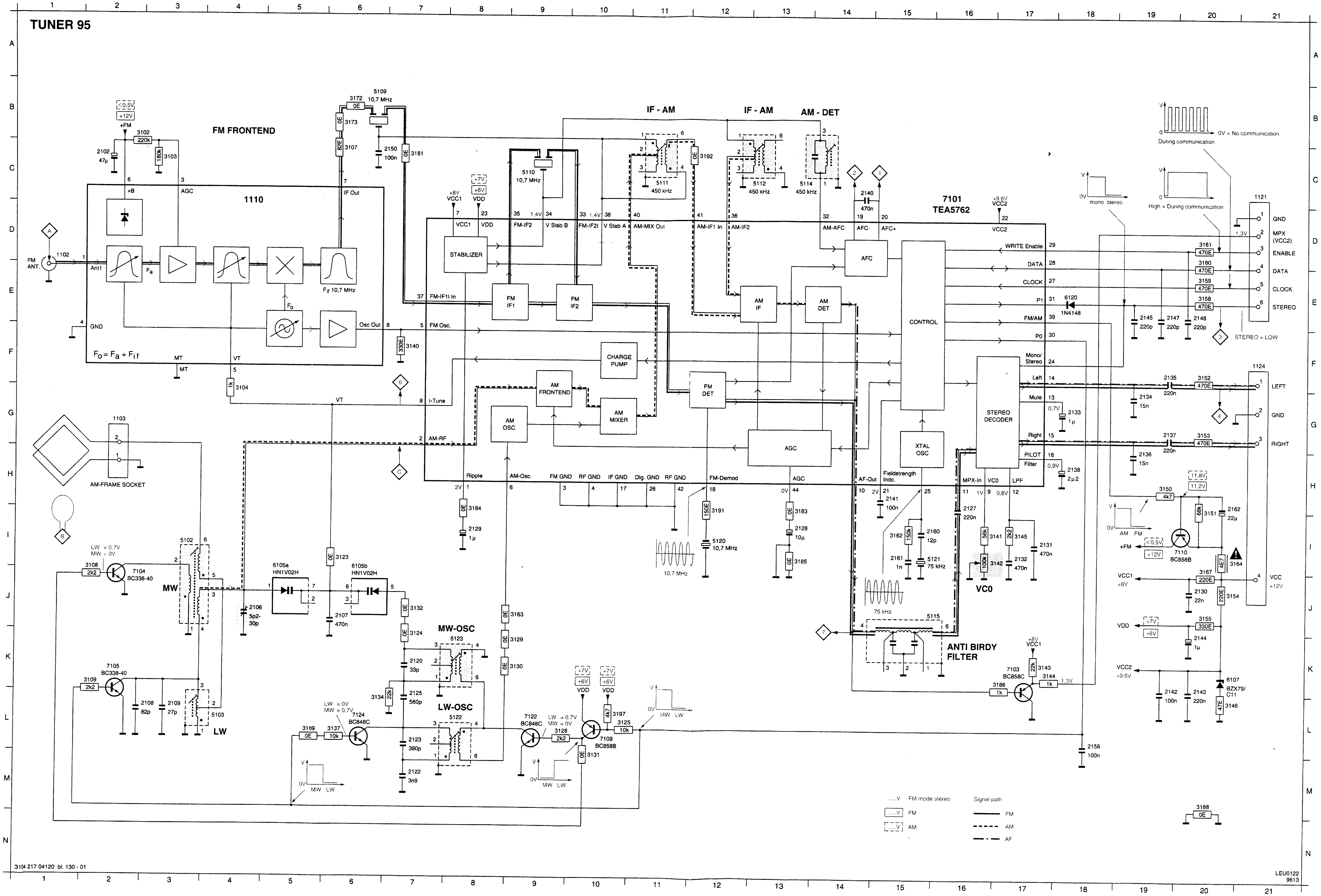
△ only FW650 (04120)

○ only FW610 (04340)

TUNER 95
3104 217 04120/04340 bl. 110 - 01

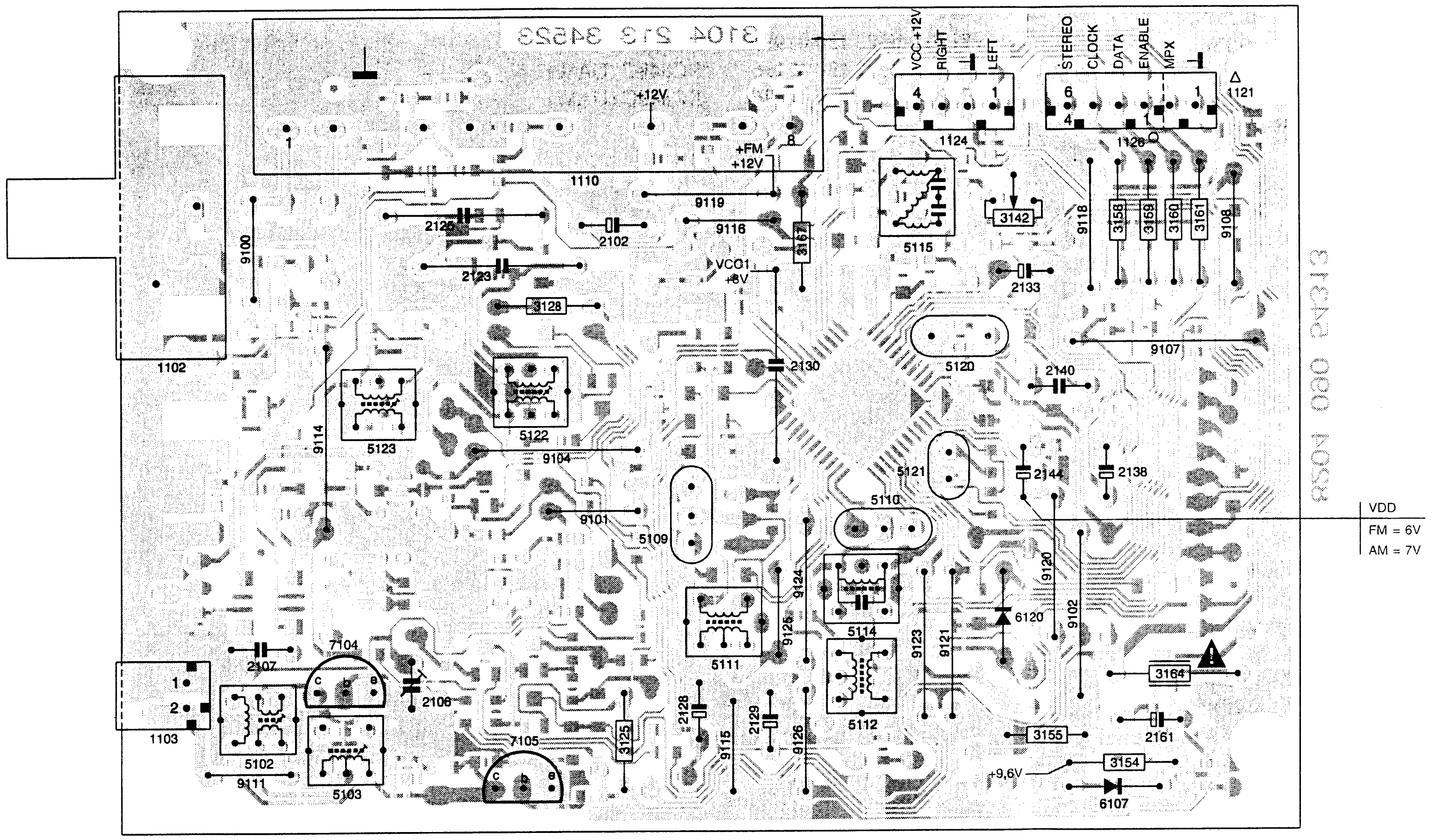
LEU0119
9533

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
2102	C2
2106	J4
2107	J6
2108	L3
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E20
2150	C6
2158	L18
2160	I15
2161	I15
2162	H20
3102	B2
3103	C3
3104	G4
3107	C6
3108	J2
3109	K2
3123	I6
3124	K7
3125	L10
3128	L9
3129	K9
3130	K9
3131	M10
3132	J7
3134	L6
3137	L6
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E20
3159	E20
3160	D20
3161	D20
3162	I15
3163	J9
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3191	I12
3192	C12
3197	L10
5102	I3
5103	L4
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5120	I12
5121	I15
5122	L8
5123	K8
6105a	I5
6105b	I6
6107	K20
6120	E18
7101	C16
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6


TUNER 95
FM FRONTEND
1110
FM ANT.
1102
Ant1
Fa
Fif 10,7 MHz
Fo
Osc Out
IF Out
AGC
GND
MT
VT
Fo = Fa + Fif
5109 10,7 MHz
5110 10,7 MHz
IF - AM
IF - AM
AM - DET
5111 450 kHz
5112 450 kHz
5114 450 kHz
7101 TEA5762
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
MPX-In
VCO
LPF
AF-Out
Fieldstrength Indc.
FM-IF1 In
FM Osc.
I-Tune
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC1
VDD
VCC2
1121
GND
MPX (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
0V = No communication
During communication
High = During communication
mono stereo
1124
LEFT
GND
RIGHT
VCC +12V
1103
AM-FRAME SOCKET
5102
MW
LW
5103
7104 BC338-40
7105 BC338-40
6105a HN1V02H
6105b HN1V02H
MW-OSC
5123
LW-OSC
5122
7124 BC848C
7122 BC848C
7109 BC858B
7103 BC858C
7110 BC858B
6107 BZX79/ C11
6120 1N4148
ANTI BIRDY FILTER
5115
5121 75 kHz
5120 10,7 MHz
VCO
10,7 MHz
75 kHz
FM mode stereo
FM
AM
Signal path
FM
AM
AF
3104 217 04120 bl. 130 - 01
LEU0122 9613

1102	E3	1124	C9	2107	G4	2129	G8	2140	E10	3128	D6	3158	D10	3164	G10	5109	F7	5114	G8	5122	E6	7104	G5	9102	G10	9111	H4	9118	D10	9123	G9
1103	G3	1126	C10	2123	D5	2130	E8	2144	F10	3142	D9	3159	D10	3167	D8	5110	F8	5115	D9	5123	E5	7105	H6	9104	E6	9114	E4	9119	D7	9124	F8
1110	C6	2102	D6	2125	D5	2133	D9	2161	H10	3154	H10	3160	D11	5102	H4	5111	G7	5120	E9	6107	H10	9100	D4	9107	E10	9115	H7	9120	F10	9125	G8
1121	C11	2106	G5	2128	G7	2138	F10	3125	H7	3155	H10	3161	D11	5103	H5	5112	G8	5121	F9	6120	G9	9101	F6	9108	D11	9116	D7	9121	G9	9126	H8

TUNER 95 Component side view


3104 213 34523
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
4
1
6
1121
1124
1126
+12V
+FM
+12V
1110
9119
9116
2125
2102
2123
VCO1
+8V
3167
5115
3142
2133
9118
3158
3159
3160
3161
9108
9100
1102
3128
2130
5120
9107
2140
5123
5122
9114
9104
5121
2144
2138
5110
9101
5109
VDD
FM = 6V
AM = 7V
9124
9120
9102
6120
9123
9121
2107
7104
2106
5111
5114
3164
1103
5102
5103
9111
7105
3125
2128
9115
2129
9126
5112
3155
2161
+9,6V
3154
6107

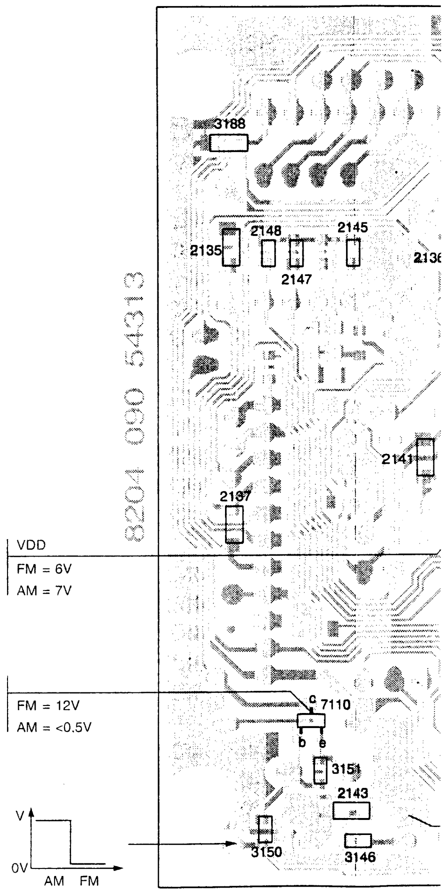
△ only FW650 (04120)

○ only FW610 (04340)

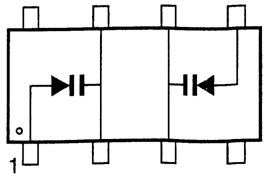
TUNER 95
3104 217 04120/04340 bl. 110 - 01

2108	H9	2127	D6	2135	D3	2142	E5	2148	D4	2161	F5	3107
2109	H9	2131	D6	2136	D5	2143	H4	2150	E7	3102	C9	3108
2120	E10	2132	D5	2137	F3	2145	D4	2158	G5	3103	C9	3109
2122	E8	2134	D5	2141	E5	2147	D4	2160	F5	3104	D9	3123

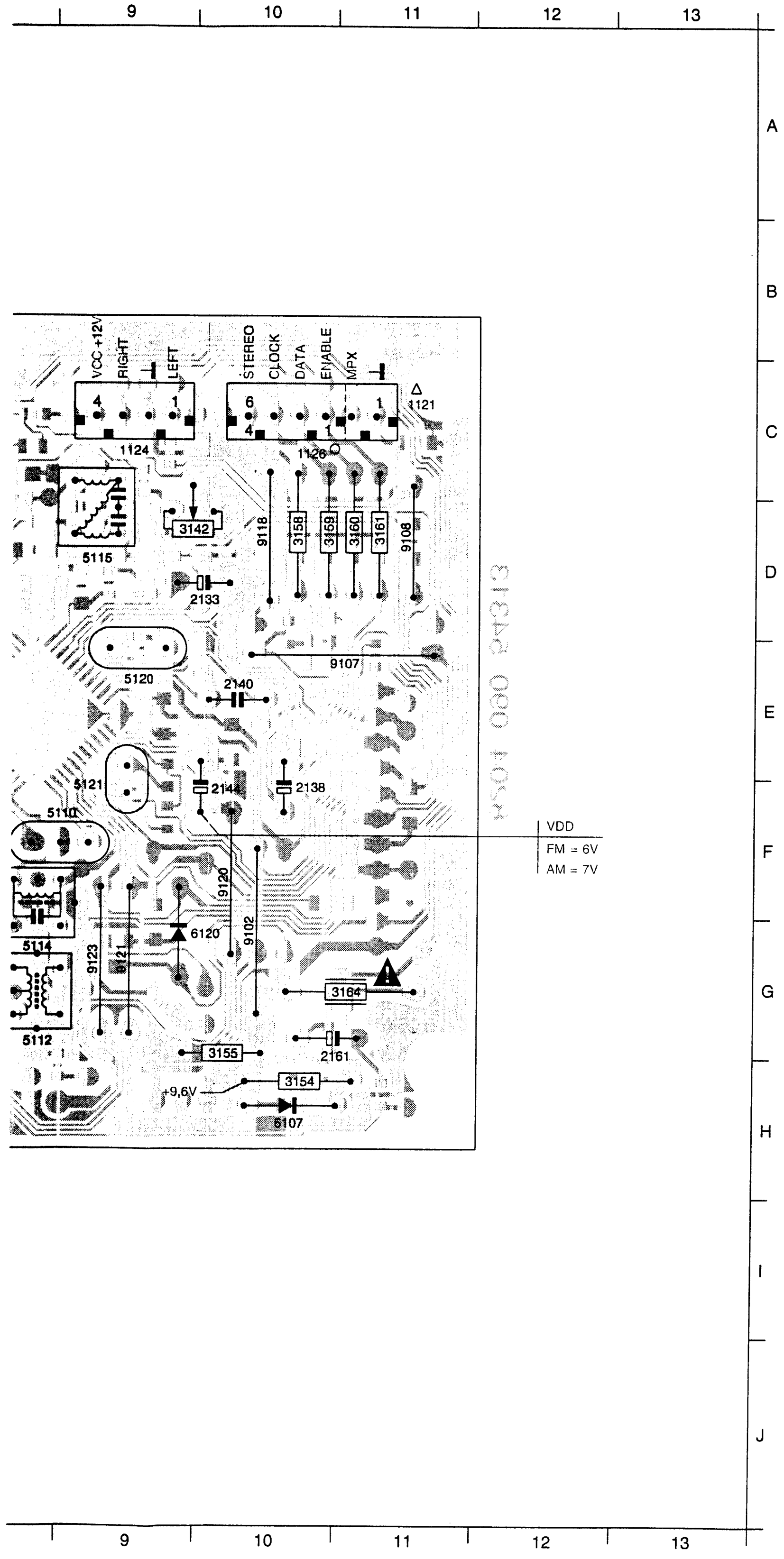
TUNER 95 Copper side view


8204 090 54313
3188
2148
2145
2135
2147
2141
2137
VDD
FM = 6V
AM = 7V
FM = 12V
AM = <0.5V
7110
c
b
e
3151
2143
V
0V
AM
FM
3150
3146

IC 6105

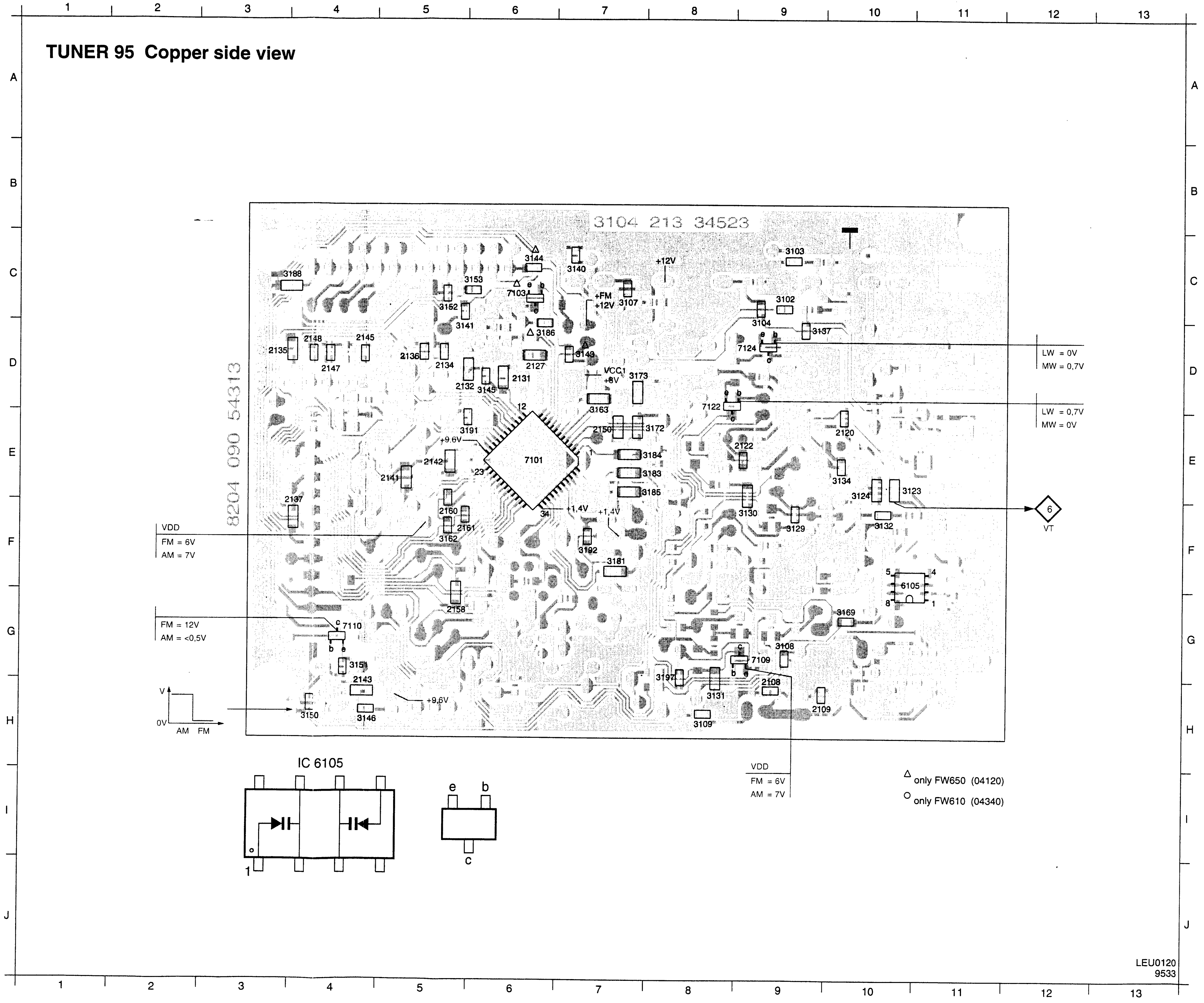


7104	G5	9102	G10	9111	H4	9118	D10	9123	G9
7105	H6	9104	E6	9114	E4	9119	D7	9124	F8
9100	D4	9107	E10	9115	H7	9120	F10	9125	G8
9101	F6	9108	D11	9116	D7	9121	G9	9126	H8


9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
4
1
6
4
1
1121
1124
1126
5115
3142
9118
3158
3159
3160
3161
9108
2133
5120
9107
2140
5121
2144
2138
5110
VDD
FM = 6V
AM = 7V
5114
6120
9120
9102
9123
9121
3164
5112
3155
2161
+9,6V
3154
6107
8204 090 54313

2108	H9	2127	D6	2135	D3	2142	E5	2148	D4	2161	F5	3107	C7	3124	E10	3132	F10	3141	D5	3146	H4	3153	C5	3172	E7	3184	E7	3191	E5	7101	E6	7122	D8
2109	H9	2131	D6	2136	D5	2143	H4	2150	E7	3102	C9	3108	G9	3129	F9	3134	E10	3143	D7	3150	H4	3162	F5	3173	D7	3185	E7	3192	F7	7103	C6	7124	D9
2120	E10	2132	D5	2137	F3	2145	D4	2158	G5	3103	C9	3109	H8	3130	F9	3137	D9	3144	C6	3151	G4	3163	E7	3181	F7	3186	D6	3197	H8	7109	G9		
2122	E8	2134	D5	2141	E5	2147	D4	2160	F5	3104	D9	3123	E10	3131	H8	3140	C7	3145	D6	3152	C5	3169	G10	3183	E7	3188	C3	6105	F10	7110	G4		

TUNER 95 Copper side view


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
3104 213 34523
8204 090 54313
3188
3144
3140
+12V
3103
3153
7103
+FM
+12V
3107
3152
3186
3102
3141
3104
3137
2135
2148
2145
2136
2134
2127
3149
7124
LW = 0V
MW = 0,7V
2147
2132
3145
2131
VCC1
+8V
3173
3163
7122
LW = 0,7V
MW = 0V
12
3191
+9,6V
2150
3172
2120
2122
7101
3184
3183
3185
2142
23
2141
3134
3124
3123
2137
2160
2161
34
+1,4V
+1,4V
3130
3129
3132
6
VT
VDD
FM = 6V
AM = 7V
3162
3192
3181
6105
5
4
8
1
2158
3169
FM = 12V
AM = <0,5V
7110
3108
7109
3197
3131
2108
3151
2143
+9,6V
V
0V
AM
FM
3150
3146
3109
2109
IC 6105
1
e
b
c
VDD
FM = 6V
AM = 7V
△ only FW650 (04120)
○ only FW610 (04340)
LEU0120
9533

Remarks

ELECTRICAL PARTSLIST TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	FM ANTENNA SOCKET
1103	4822 265 31184	AM ANTENNA SOCKET
1110	4822 210 10492	TUNER FE415-G11

CAPACITORS

2102	4822 124 40433	47UF20% 25V
2106	4822 125 60102	5P2-30P N750 100V
2107	4822 121 51252	470NF 5% 63V
2108	4822 122 33515	82PF 5%NP0 63V
2109	5322 122 31946	27PF 5%NP0 63V
2120	5322 122 32659	33PF 5% 50V
2122	5322 126 10465	3,9NF10%X7R 63V
2123	4822 121 51254	390PF 1% 400V
2125	4822 121 51381	560PF 5% 400V
2127	4822 122 32927	220NF +80-20% 50V
2128	4822 124 41579	10UF 20% 50V
2129	4822 124 40242	1UF20% 63V
2130	4822 126 11585	22NF+80-20% 25V
2131	4822 122 33325	470NF 16V
2132	4822 122 33325	470NF 16V
2133	4822 124 40242	1UF20% 63V
2134	4822 122 33128	15NF10%X7R 63V
2135	4822 122 32927	220NF +80-20%Y5V 50V
2136	4822 122 33128	15NF10%X7R 63V
2137	4822 122 32927	220NF +80-20%Y5V 50V
2138	4822 124 41576	2,2UF 20% 50V
2140	4822 121 51252	470NF 5% 63V
2141	4822 122 31947	100NF20%Y5V 63V
2142	4822 122 31947	100NF20%Y5V 63V
2143	4822 122 32927	220NF +80-20%Y5V 50V
2144	4822 124 40242	1UF20% 63V
2145	4822 122 33575	220PF 5%NPO 50V
2147	4822 122 33575	220PF 5%NPO 50V
2148	4822 122 33575	220PF 5%NPO 50V
2150	4822 122 31947	100NF20%Y5V 63V
2158	4822 122 31947	100NF20%Y5V 63V
2160	4822 122 32139	12PF
2161	5322 122 34123	1NF
2162	4822 124 41596	22UF 50V

RESISTORS

3102	4822 051 20224	220K00 5% 0,1W
3103	4822 051 20184	180K00 5% 0,1W
3104	4822 051 10102	1K00 2% 0,25W
3107	4822 051 20829	82R00 5% 0,1W
3108	4822 051 20222	2K20 5% 0,1W
3109	4822 051 20222	2K20 5% 0,1W
3123	4822 051 10008	0R00 5% 0,25W
3124	4822 051 10008	0R00 5% 0,25W
3125	4822 116 83864	10K 5% 0,5W
3128	4822 116 52256	2K2 5% 0,5W

RESISTORS

3129	4822 051 20008	0R00 JUMP. (0805)
3130	4822 051 10008	0R00 5% 0,25W
3131	4822 051 10008	0R00 5% 0,25W
3132	4822 051 20008	0R00 JUMP. (0805)
3134	4822 051 20223	22K00 5% 0,1W
3137	4822 051 20103	10K00 5% 0,1W
3140	4822 051 20331	330R00 5% 0,1W
3141	4822 051 20563	56K00 5% 0,1W
3142	4822 100 11163	100K 30%LIN 0,1W
3143	4822 051 20223	22K00 5% 0,1W
3144	4822 051 10102	1K00 2% 0,25W
3145	4822 051 20222	2K20 5% 0,1W
3146	4822 051 20479	47R00 5% 0,1W
3150	4822 051 20472	4K70 5% 0,1W
3151	4822 051 20683	68K00 5% 0,1W
3152	4822 051 20471	470R00 5% 0,1W
3153	4822 051 20471	470R00 5% 0,1W
3154	4822 116 52215	220E 5% 0,5W
3155	4822 116 52219	330E 5% 0,5W
3158	4822 116 52224	470E 5% 0,5W
3159	4822 116 52224	470E 5% 0,5W
3160	4822 116 52224	470E 5% 0,5W
3161	4822 116 52224	470E 5% 0,5W
3162	4822 051 20154	150K
3163	4822 051 10008	0R00 5% 0,25W
3164	4822 052 10478	4R7
3167	4822 116 52215	220E 5% 0,5W
3169	4822 051 20008	0R00 JUMP. (0805)
3172	4822 051 10008	0R00 5% 0,25W
3173	4822 051 10008	0R00 5% 0,25W
3181	4822 051 10008	0R00 5% 0,25W
3183	4822 051 10008	0R00 5% 0,25W
3184	4822 051 10008	0R00 5% 0,25W
3185	4822 051 10008	0R00 5% 0,25W
3186	4822 051 10102	1K00 2% 0,25W
3188	4822 051 10008	0R00 5% 0,25W
3191	4822 117 10353	150R 5%
3192	4822 051 20008	0R00 JUMP. (0805)
3197	4822 051 20472	4K70 5% 0,1W

COILS

5102	4822 157 71634	MW AERIAL COIL
5103	4822 157 71635	LW AERIAL COIL
5109	4822 157 71639	FIL-CER 10.7MHZ
5110	4822 242 70665	FIL-CER 10.7MHZ
5111	4822 158 60511	AM-IF COIL
5112	4822 157 70302	AM-IF COIL
5114	4822 157 71637	AM-DET COIL
5115	4822 157 71636	BIRDIE COIL
5120	4822 242 10251	FIL CER 10.7MHZ
5121	4822 242 81021	CRYSTAL 75KHZ
5122	4822 157 60517	LW OSC COIL
5123	4822 157 60517	MW OSC COIL

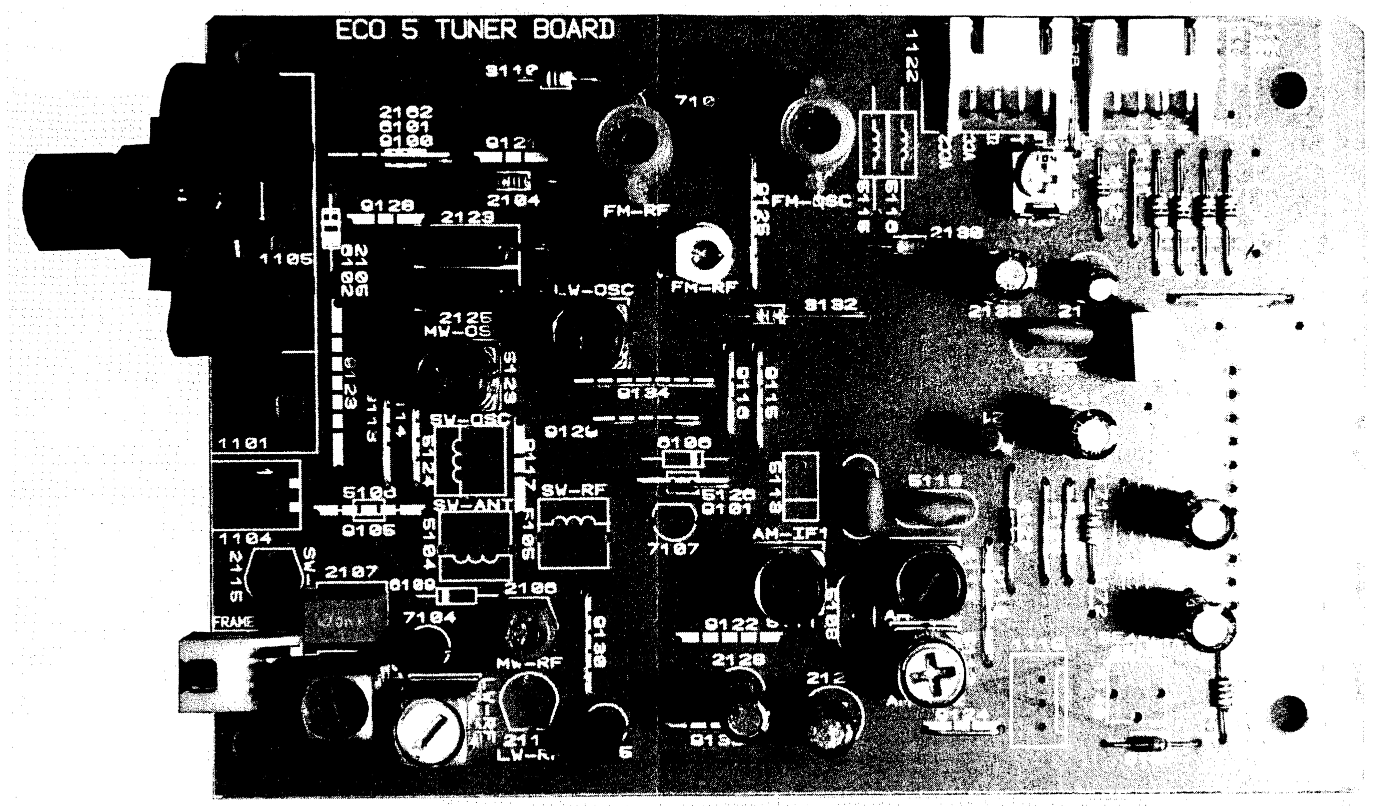
ELECTRICAL PARTSLIST TUNER 95 BOARD

DIODES

6105	4822 130 83075	HN1V02H
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148 (COL)

TRANSISTORS & IC's

7101	4822 209 90315	EA5762H/V1
7103	4822 130 42513	BC858C (UAW
7104	5322 130 44779	BC338-40 (UAW
7105	5322 130 44779	BC338-40 (UAW)
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C (UAW)
7124	5322 130 42136	BC848C (UAW)


ECO 5 TUNER BOARD

TUNER BOARD ECO5

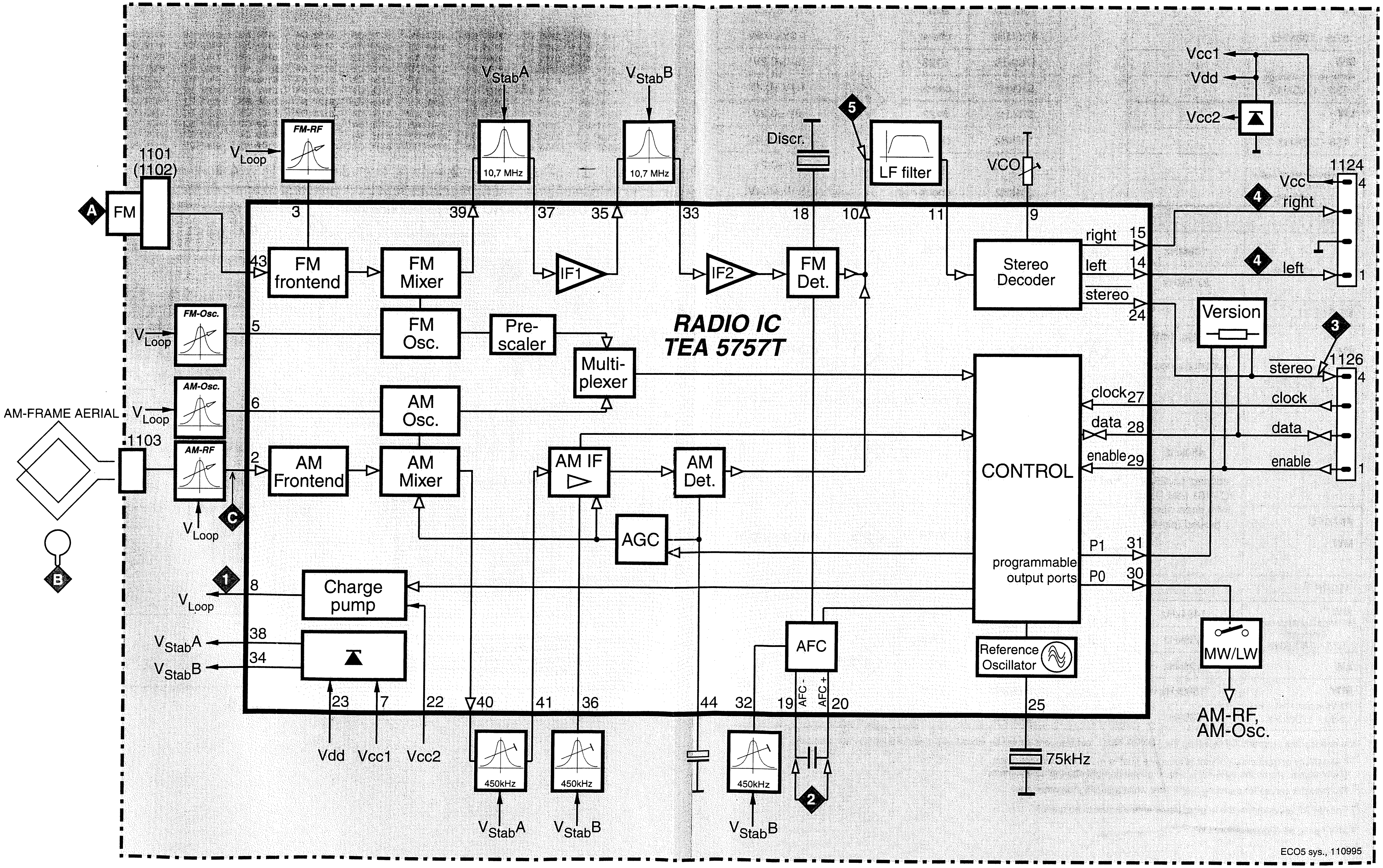
TABLE OF CONTENTS

Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4

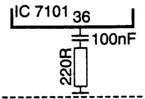
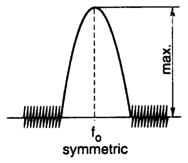
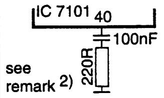
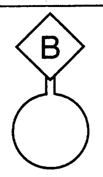
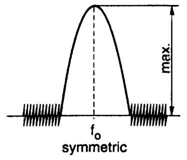
BLOCKDIAGRAM

TUNER BOARD

ECO 5 systems


RADIO IC
TEA 5757T
FM
A
1101
(1102)
V_{Loop}
FM-RF
$V_{Stab}A$
$V_{Stab}B$
10,7 MHz
10,7 MHz
Discr.
5
LF filter
VCO
Vcc1
Vdd
Vcc2
1124
Vcc
right
left
4
1
3
39
37
35
33
18
10
11
9
43
FM frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
right 15
left 14
stereo
24
FM-Osc.
5
FM Osc.
Pre-scaler
Multi-plexer
Version
1126
stereo
clock
data
enable
AM-Osc.
6
AM Osc.
AM-FRAME AERIAL
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
CONTROL
clock 27
data 28
enable 29
C
B
AGC
P1 31
P0 30
programmable output ports
1
8
Charge pump
38
34
$V_{Stab}A$
$V_{Stab}B$
AFC
Reference Oscillator
MW/LW
AM-RF, AM-Osc.
23
7
22
40
41
36
44
32
19
20
AFC -
AFC +
25
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
75kHz
2
$V_{Stab}A$
$V_{Stab}B$
$V_{Stab}B$
ECO5 sys., 110995

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM			108MHz	5130	1	8V ±0.2V
87.5 - 108MHz			87.5MHz	check		4.3V ±0.5V
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM RF						
FM 87.5 - 108MHz	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
	87.5MHz		87.5MHz	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 26 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	4	 max. f_o symmetric
			see remark [2]  IC 7101 40 100nF 220R	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz		1494kHz	2106	4	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, 020995

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation
(input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

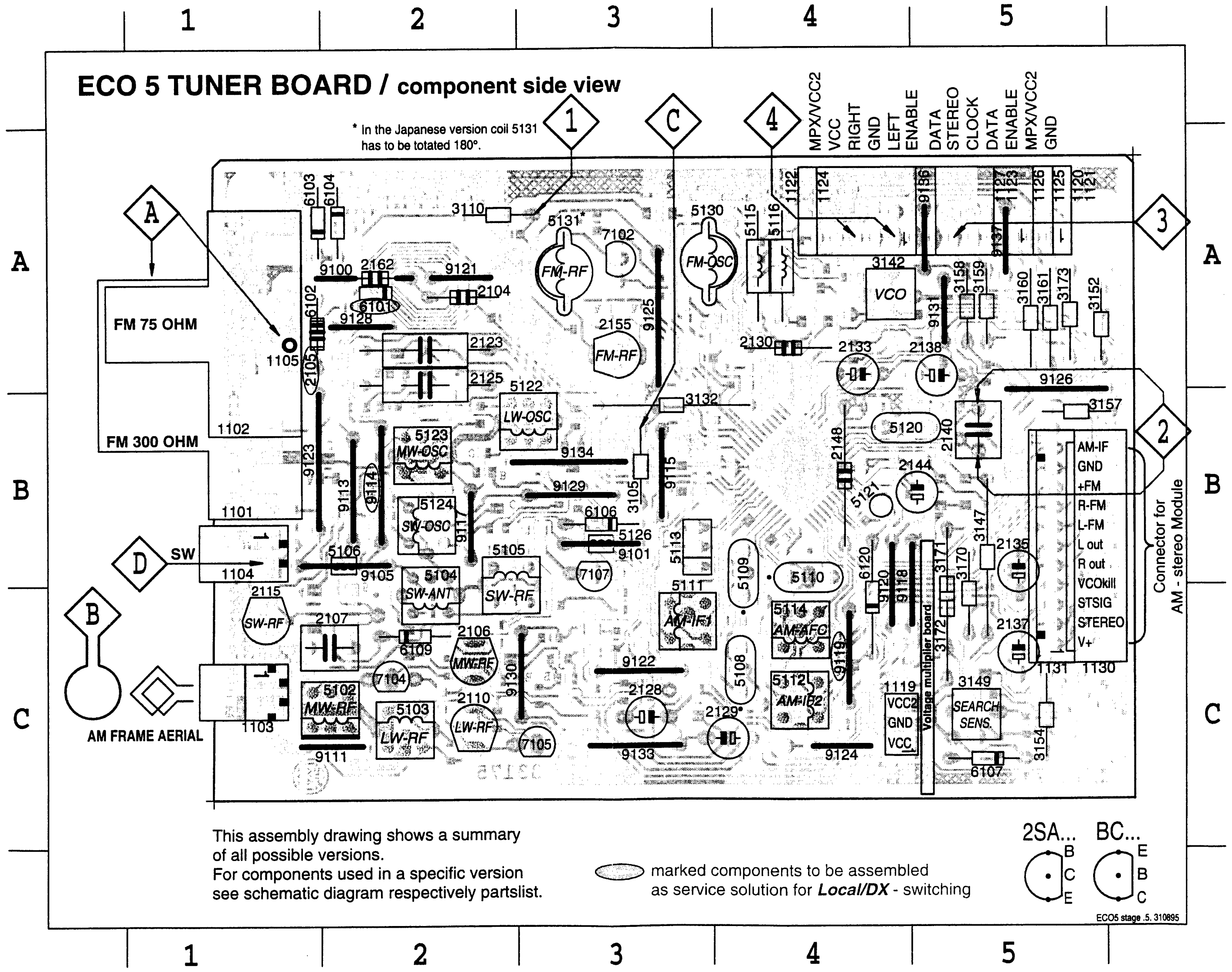
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

1101	A1	2106	C2	2137	C5	3147	B5	3172	C5	5112	C4	5130	A3	7104	C2	9118	B4	9130	C3
1102	A1	2107	C2	2138	A5	3149	C5	3173	A5	5113	B3	5131	A3	7105	C3	9119	C4	9131	A5
1103	C1	2110	C2	2140	B5	3152	A5	5102	C2	5114	C4	6101	A2	7107	B3	9120	B4	9133	C3
1104	B1	2115	C1	2144	B5	3154	C5	5103	C2	5115	A4	6102	A1	9100	A2	9121	A2	9134	B3
1105	A1	2123	A2	2148	B4	3157	B5	5104	C2	5116	A4	6103	A1	9101	B3	9122	C3	9136	A5
1119	C5	2125	A2	2155	A3	3158	A5	5105	B2	5120	B4	6104	A2	9105	B2	9123	B1	9137	A5
1120	A5	2128	C3	2162	A2	3159	A5	5106	B2	5121	B4	6106	B3	9111	C2	9124	C4		
1130	B5	2129	C4	3105	B3	3160	A5	5108	C4	5122	B3	6107	C5	9113	B2	9125	A3		
1131	B5	2130	A4	3110	A2	3161	A5	5109	B4	5123	B2	6109	C2	9114	B2	9126	B5		
2104	A2	2133	A4	3132	B3	3170	C5	5110	B4	5124	B2	6120	C4	9115	B3	9128	A2		
2105	A1	2135	B5	3142	A4	3171	C5	5111	C3	5126	B3	7102	A3	9117	B2	9129	B3		



ECO 5 TUNER BOARD / component side view

* In the Japanese version coil 5131 has to be totated 180°.

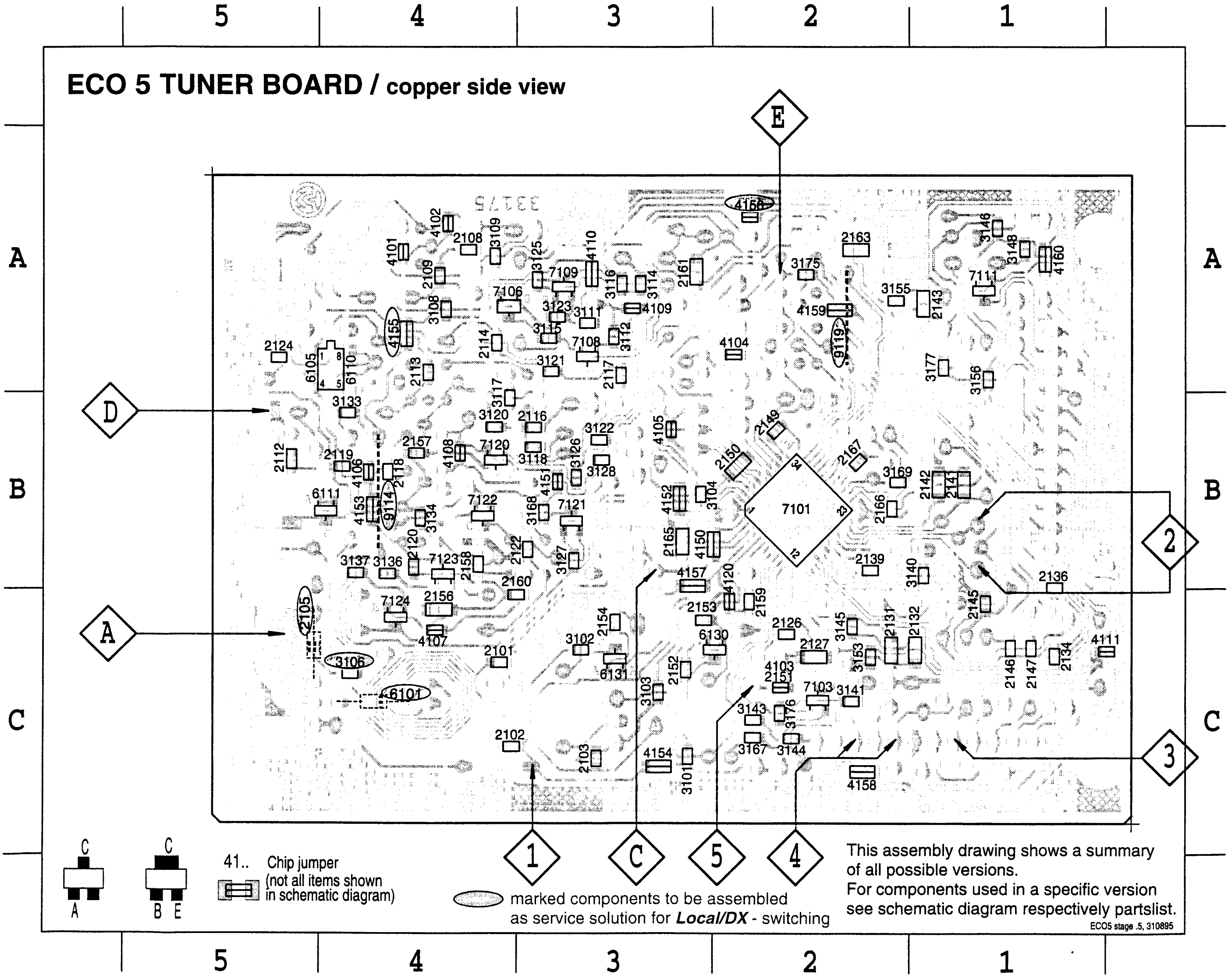
1
2
3
4
5
A
B
C
MPX/VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX/VCC2
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
AM-IF1
AM-AFC
AM-IF2
MW-RF
LW-RF
SEARCH SENS.
Voltage multiplier board
VCC2
GND
VCC
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
E
B
C
ECO5 stage .5. 310895

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

2101	C4	2119	B4	2141	B1	2154	C3	3101	C3	3116	A3	3133	B4	3153	C2	4103	C2	4151	B3	6110	A4	7121	B3
2102	C4	2120	B4	2142	B1	2156	C4	3102	C3	3117	B4	3134	B4	3155	A2	4104	A2	4152	B3	6111	B4	7122	B4
2103	C3	2122	B3	2143	A1	2157	B4	3103	C3	3118	B3	3136	B4	3156	A1	4105	B3	4153	B4	6130	C2	7123	B4
2108	A4	2124	A5	2145	C1	2158	B4	3104	B3	3120	B4	3137	B4	3167	C2	4106	B4	4154	C3	6131	C3	7124	C4
2109	A4	2126	C2	2146	C1	2159	C2	3106	C4	3121	A3	3140	B1	3168	B3	4107	C4	4155	A4	7101	B2		
2112	B5	2127	C2	2147	C1	2160	C4	3108	A4	3122	B3	3141	C2	3169	B2	4108	B4	4156	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3109	A4	3123	A3	3143	C2	3175	A2	4109	A3	4157	B3	7106	A4		
2114	A4	2132	C1	2150	B2	2163	A2	3111	A3	3125	A3	3144	C2	3176	C2	4110	A3	4158	C2	7108	A3		
2116	B3	2134	C1	2151	C2	2165	B3	3112	A3	3126	B3	3145	C2	3177	A1	4111	C1	4159	A2	7109	A3		
2117	A3	2136	B1	2152	C3	2166	B2	3114	A3	3127	B3	3146	A1	4101	A4	4120	C2	4160	A1	7111	A1		
2118	B4	2139	B2	2153	C3	2167	B2	3115	A3	3128	B3	3148	A1	4102	A4	4150	B2	6105	A4	7120	B4		

ECO 5 TUNER BOARD / copper side view



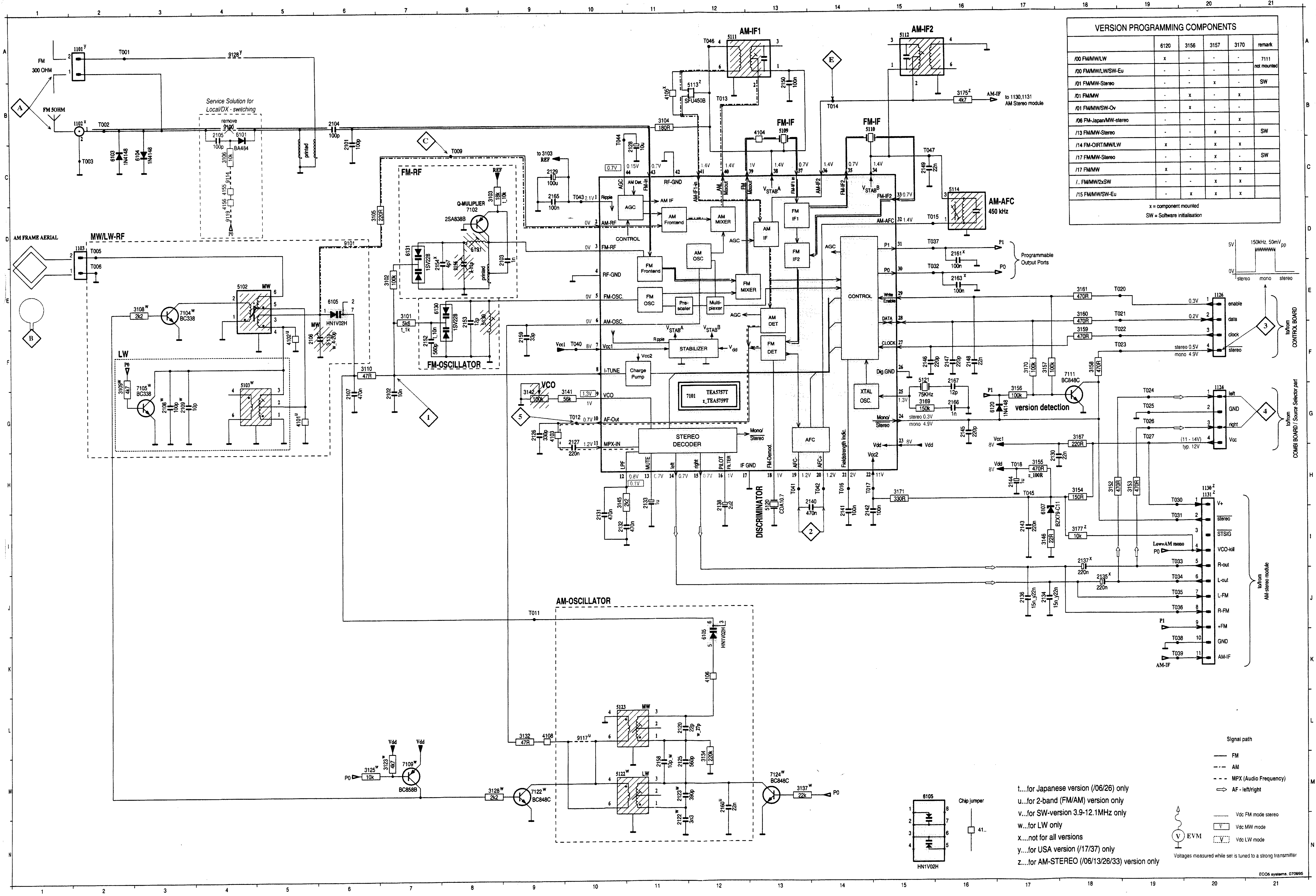
41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 stage .5, 310895

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50HM
AM FRAME AERIAL
Service Solution for Local/DX - switching
MW/LW-RF
LW
MW
FM-RF
Q-MULIPLIER 7102
2SA838B
FM-OSCILLATOR
VCO
AM-IF1
AM-IF2
FM-IF
AM-AFC 450 kHz
AGC
AM Frontend
AM MIXER
AM IF
FM IF1
FM IF2
AM OSC
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
AM DET
FM DET
STABILIZER
Charge Pump
TEA5757T
TEA5759T
STEREO DECODER
AFC
CONTROL
XTAL OSC.
DISCRIMINATOR
Programmable Output Ports
version detection
to 1130,1131 AM Stereo module
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
AM-OSCILLATOR
150kHz, 50mVpp
5V
0V
stereo
mono
stereo
enable
data
clock
left
GND
right
Vcc
V+
stereo
STSIG
VCO-kill
R-out
L-out
L-FM
R-FM
+FM
GND
AM-IF
ECO5 systems. 070995

VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/17 FM/MW-Stereo	-	-	x	-	SW
/17 FM/MW	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

6105
HN1V02H

Chip jumper
41..

t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) version only

Signal path
- FM
- AM
- MPX (Audio Frequency)
- AF - left/right

EVM
- Vdc FM mode stereo
- Vdc MW mode
- Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1124	G20
1126	E20
1130	H20
1131	H20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	I18
2138	H12
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2165	C 9
2166	G16
2167	F16
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	D 6
3108	E 3
3109	F 2
3110	F 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3141	G10
3142	G 9
3145	H10
3146	I17
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3177	I18
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7104	E 3
7105	F 2
7109	M 7
7111	F18
7122	M 9
7124	M13
9100	B 4
9101	D 6
9117	L10
9128	A 4

MISCELLANEOUS

1101	4822 267 31505	SOCKET 2P CLICKFIT

DIODES

6103	4822 130 30621	1N4148
6104	4822 130 30621	1N4148
6105	4822 130 83075	HN1V02H
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148
6130	4822 130 82833	1SV228
6131	4822 130 82833	1SV228

TRANSISTORS

7102	4822 130 60093	2SA838B
7111	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1,RADIO IC

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	CER. FILTER 10,7MHZ
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 71637	AM-AFC FILTER 450KHZ
5120	4822 242 82065	CER. DISCRIMINATOR
5121	4822 242 81021	QUARTZ 75kHz
5123	4822 157 60517	110µH 8%
5130	4822 156 30947	RF COIL 1,5 TURNS
5131	4822 156 30947	RF COIL 1,5 TURNS

RESISTORS

3105	4822 116 52215	220R	5%	0,16W
3110	4822 116 52195	47R	5%	0,5W
3132	4822 116 52195	47R	5%	0,5W
3142	4822 100 11163	TRIMPOT.100k lin.		
3152	4822 116 52224	470R	5%	0,5W
3154	4822 116 52211	150R	5%	0,5W
3158	4822 116 52224	470R	5%	0,5W
3159	4822 116 52224	470R	5%	0,5W
3160	4822 116 52224	470R	5%	0,5W
3161	4822 116 52224	470R	5%	0,5W
3170	4822 116 52234	100k	5%	0,5W
3171	4822 116 52219	330R	5%	0,5W

CHIP RESISTORS

3101	4822 051 20562	5k6	5%	0,1W
3102	4822 051 20104	100k	5%	0,1W
3103	4822 051 20183	18k	5%	0,1W
3104	4822 051 20181	180R	5%	0,1W
3134	4822 051 20224	220k	5%	0,1W
3140	4822 051 20008	CHIP JUMPER 0805		
3141	4822 051 20563	56k	5%	0,1W
3145	4822 051 20222	2k2	5%	0,1W
3146	4822 051 20229	22R	5%	0,1W
3153	4822 051 20471	470R	5%	0,1W
3155	4822 051 20471	470R	5%	0,1W
3167	4822 051 20221	220R	5%	0,1W

CHIP RESISTORS

3169	4822 051 20154	150k	5%	0,1W
4101	4822 051 20008	CHIP JUMPER 0805		
4102	4822 051 20008	CHIP JUMPER 0805		
4103	4822 051 20008	CHIP JUMPER 0805		
4104	4822 051 20008	CHIP JUMPER 0805		
4105	4822 051 20008	CHIP JUMPER 0805		
4106	4822 051 20008	CHIP JUMPER 0805		
4108	4822 051 20008	CHIP JUMPER 0805		
4111	4822 051 20008	CHIP JUMPER 0805		
4120	4822 051 20008	CHIP JUMPER 0805		
4150	4822 051 10008	CHIP JUMPER1206		
4152	4822 051 10008	CHIP JUMPER1206		
4153	4822 051 10008	CHIP JUMPER1206		
4154	4822 051 10008	CHIP JUMPER1206		
4157	4822 051 10008	CHIP JUMPER1206		
4158	4822 051 10008	CHIP JUMPER1206		
4159	4822 051 10008	CHIP JUMPER1206		

CAPACITORS

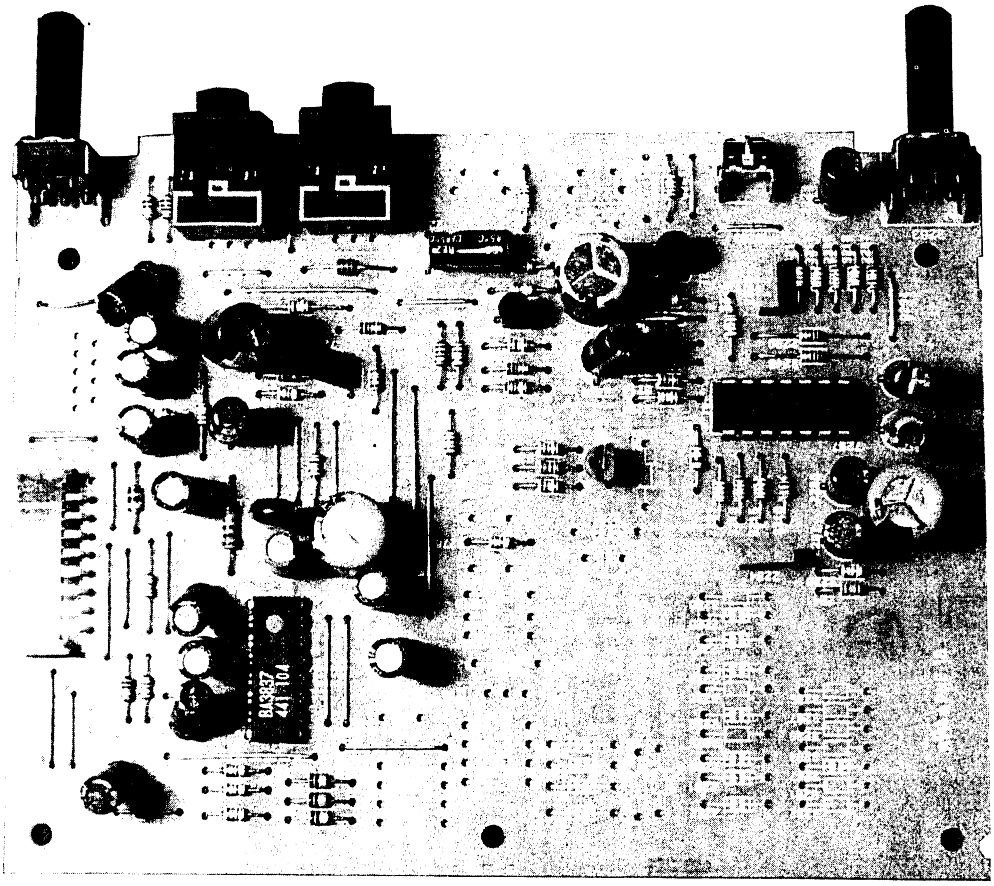
2104	4822 122 33195	100pF	10%	50V
2106	4822 125 60101	10pF		VARIABLE
2107	4822 121 51252	470nF	5%	63V
2125	4822 121 51381	560pF	1%	400V
2128	4822 124 41579	10µF	20%	50V
2129	4822 124 41584	100µF	20%	10V
2130	4822 126 11585	22nF+80/-20%		50V
2133	4822 124 40242	1µF	20%	63V
2135	4822 124 40746	0,22µF	20%	63V
2137	4822 124 40746	0,22µF	20%	63V
2138	4822 124 41576	2,2µF	20%	50V
2140	4822 121 51252	470nF	5%	63V
2144	4822 124 40242	1µF	20%	63V
2148	4822 126 11585	22nF+80/-20%		50V
2155	4822 125 60101	10pF		VARIABLE

CHIP CAPACITORS

2101	5322 122 32531	100pF	5%	50V
2102	4822 122 33177	10nF	20%	50V
2103	5322 122 34123	1nF	10%	50V
2120	5322 122 32658	22pF	5%	50V
2126	5322 122 31863	330pF	5%	50V
2127	4822 122 32927	220nF	10%	63V
2131	4822 122 33325	470nF	20%	50V
2132	4822 122 33325	470nF	20%	50V
2134	5322 122 32654	22nF	10%	63V
2136	5322 122 32654	22nF	10%	63V
2141	4822 122 31947	100nF	20%	50V
2142	4822 122 31947	100nF	20%	50V
2143	4822 122 32927	220nF	10%	63V
2145	4822 122 33575	220pF	5%	50V
2146	4822 122 33575	220pF	5%	50V
2147	4822 122 33575	220pF	5%	50V
2149	5322 122 32654	22nF	10%	63V
2150	4822 122 31947	100nF	20%	50V
2152	5322 116 80853	560pF	5%	63V
2153	4822 122 32139	12pF	5%	63V
2159	5322 122 32659	33pF	5%	50V
2160	5322 122 32654	22nF	10%	63V
2165	4822 122 31947	100nF	20%	50V
2166	5322 122 34123	1nF	10%	50V

CHIP CAPACITORS

2167	4822 122 32139	12pF	5%	63V



KARAOKE BOARD

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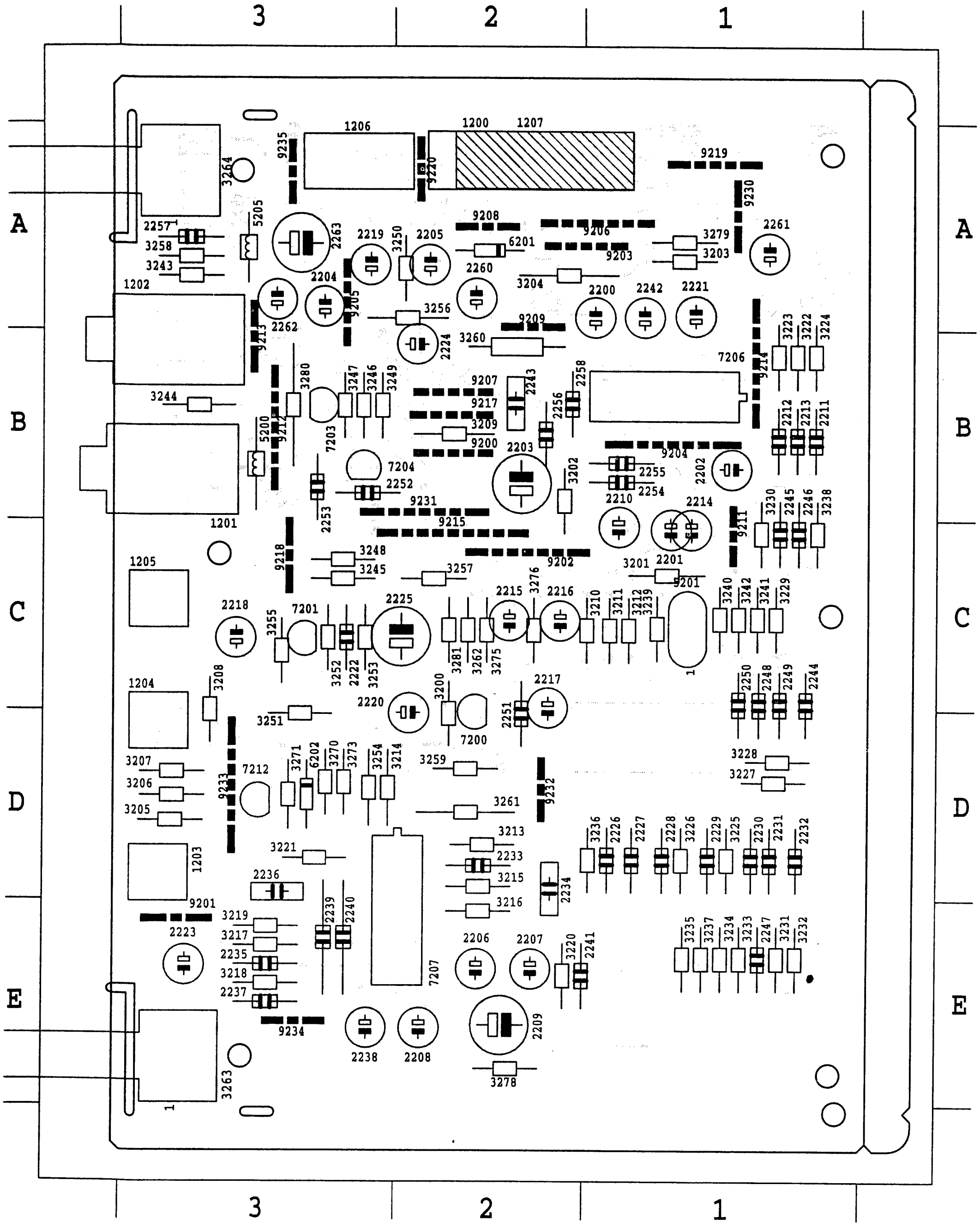
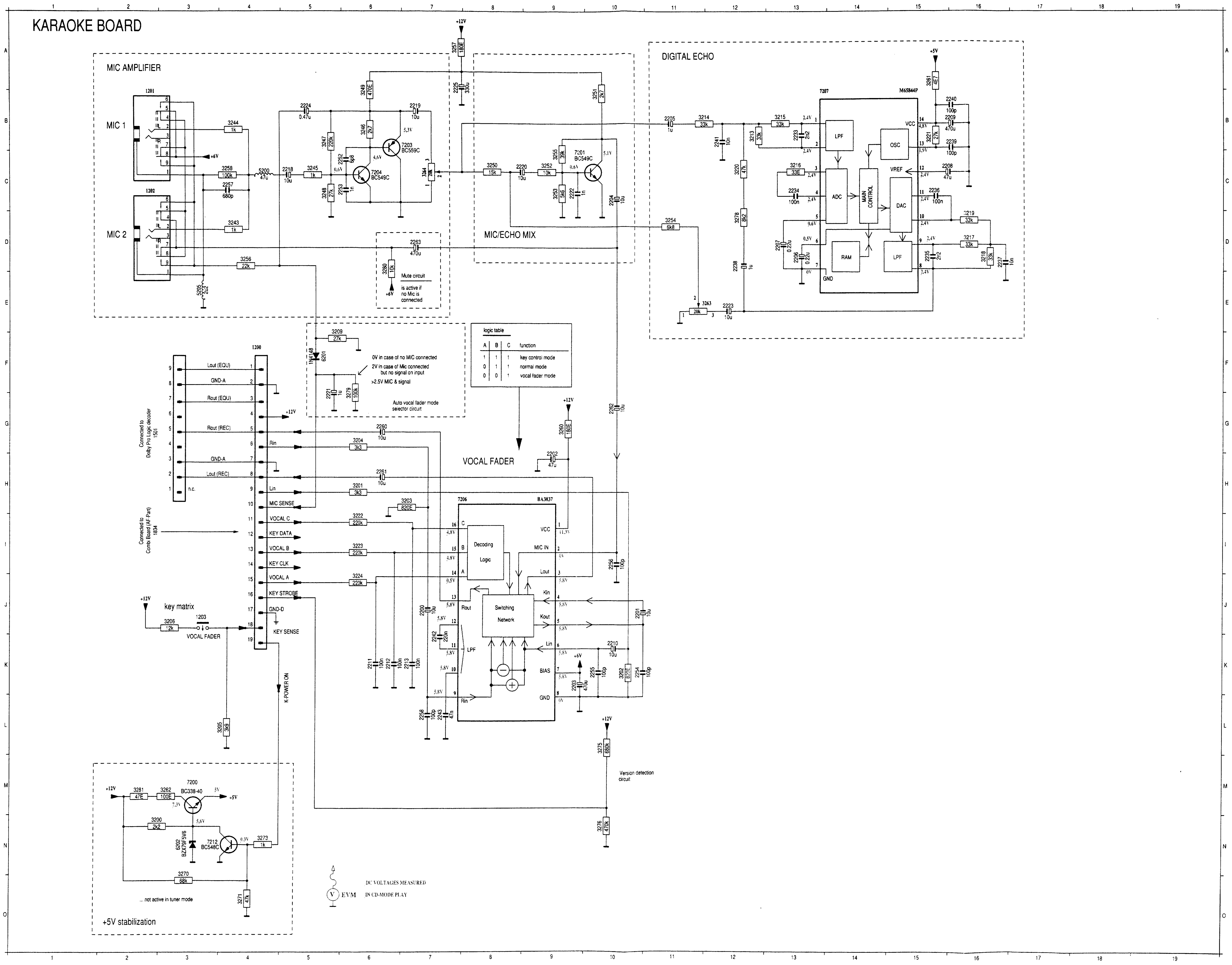
Circuit diagram 8-3
Partslist..8-4

COMPONENT LAYOUT COPPERSIDE VIEW



3254	D	3
3255	C	3
3256	A	2
3257	C	2
3258	A	3
3259	D	2
3260	B	2
3261	D	2
3262	C	2
3263	E	3
3264	A	3
3270	D	3
3271	D	3
3273	D	3
3275	C	2
3276	C	2
3278	E	2
3279	A	1
3280	B	3
3281	C	2
5200	B	3
5201	C	1
5205	A	3
6201	A	2
6202	D	3
7200	D	2
7201	C	3
7203	B	3
7204	B	3
7206	B	1
7207	E	2
7212	D	3
9200	B	2
9201	E	3
9202	C	2
9203	A	1
9204	B	1
9205	A	3
9206	A	1
9207	B	2
9208	A	2
9209	A	2
9211	C	1
9212	B	3
9213	B	3
9214	B	1
9215	C	2
9217	B	2
9218	C	3
9219	A	1
9220	A	2
9230	A	1
9231	B	2
9232	D	2
9233	D	3
9234	E	3
9235	A	3
T313	A	1
2255	B	1
2256	B	2
2257	A	3
2258	B	2
2260	A	2
2261	A	1
2262	A	3
2263	A	3
3200	D	2
3201	C	1
3202	B	2
3203	A	1
3204	A	2
3205	D	3
3206	D	3
3207	D	3
3208	D	3
3209	B	2
3210	C	1
3211	C	1
3212	C	1
3213	D	2
3214	D	3
3215	D	2
3216	E	2
3217	E	3
3218	E	3
3219	E	3
3220	E	2
3221	D	3
3222	B	1
3223	B	1
3224	B	1
3225	D	1
3226	D	1
3227	D	1
3228	D	1
3229	C	1
3230	C	1
3231	E	1
3232	E	1
3233	E	1
3234	E	1
3235	E	1
3236	D	1
3237	E	1
3238	C	1
3239	C	1
3240	C	1
3241	C	1
3242	C	1
3243	A	3
3244	B	3
3245	C	3
3246	B	3
3247	B	3
3248	C	3
3249	B	3
3250	A	2
3251	D	3
3252	C	3
3253	C	3
1201	B	3
1202	B	3
1203	D	3
1204	D	3
1205	C	3
1206	A	3
1207	A	2
2200	A	1
2201	C	1
2202	B	1
2203	B	2
2204	A	3
2205	A	2
2206	E	2
2207	E	2
2208	E	2
2209	E	2
2210	C	1
2211	B	1
2212	B	1
2213	B	1
2214	C	1
2215	C	2
2216	C	2
2217	C	2
2218	C	3
2219	A	3
2220	D	2
2221	A	1
2222	C	3
2223	E	3
2224	B	2
2225	C	2
2226	D	1
2227	D	1
2228	D	1
2229	D	1
2230	D	1
2231	D	1
2232	D	1
2233	D	2
2234	D	2
2235	E	3
2236	D	3
2237	E	3
2238	E	3
2239	E	3
2240	E	3
2241	E	2
2242	A	1
2243	B	2
2244	C	1
2245	C	1
2246	C	1
2247	E	1
2248	C	1
2249	C	1
2250	C	1
2251	D	2
2252	B	3
2253	B	3
2254	B	1


KARAOKE BOARD
MIC AMPLIFIER
MIC 1
MIC 2
1201
1202
MIC/ECHO MIX
DIGITAL ECHO
7207
M65844P
LPF
OSC
ADC
MAIN CONTROL
DAC
RAM
VCC
VREF
GND
Mute circuit
is active if no Mic is connected
0V in case of no MIC connected
2V in case of Mic connected but no signal on input
>2.5V MIC & signal
Auto vocal fader mode selector circuit
logic table
A B C function
1 1 1 key control mode
0 1 1 normal mode
0 0 1 vocal fader mode
VOCAL FADER
7206
BA3837
Decoding Logic
Switching Network
1200
Lout (EQU)
GND-A
Rout (EQU)
Rout (REC)
Lout (REC)
n.c.
Rin
Lin
MIC SENSE
VOCAL C
KEY DATA
VOCAL B
KEY CLK
VOCAL A
KEY STROBE
GND-D
KEY SENSE
Connected to Dolby Pro Logic decoder 1501
Connected to Combi Board (AF Part) 1834
key matrix
VOCAL FADER
K-POWER ON
Version detection circuit
+5V stabilization
... not active in tuner mode
7200 BC338-40
7212 BC548C
6202 BZX79F5V6
7201 BC549C
7203 BC559C
7204 BC549C
DC VOLTAGES MEASURED IN CD-MODE PLAY
EVM

1200	F 4
1201	B 2
1202	C 2
1203	J 3
2200	J 7
2201	J10
2202	H 9
2203	K 9
2204	C10
2205	B11
2206	D13
2207	D13
2208	C15
2209	B16
2210	K10
2211	K 6
2212	K 6
2213	K 7
2218	C 5
2219	B 7
2220	C 8
2221	F 5
2222	C 9
2223	E12
2224	B 5
2225	A 7
2233	B13
2234	C13
2235	D15
2236	C15
2237	D16
2238	D12
2239	B16
2240	B16
2241	B12
2242	K 7
2243	L 7
2252	C 6
2253	C 6
2254	K10
2255	K10
2256	I10
2257	C 4
2258	L 7
2260	G 6
2261	H 6
2262	G10
2263	D 7
3200	N 2
3201	H 6
3202	K10
3203	H 7
3204	G 6
3205	L 4
3206	J 3
3209	F 5
3213	B12
3214	B11
3215	B13
3216	C13
3217	D16
3218	D16
3219	D16
3220	C12
3221	B15
3222	I 6
3223	I 6
3224	J 6
3243	D 4
3244	B 4
3245	C 5
3246	B 6
3247	B 5
3248	C 5
3249	A 6
3250	C 8
3251	B10
3252	C 9
3253	C 9
3254	D11
3255	C 9
3256	D 4
3257	A 7
3258	C 4
3260	G 9
3261	A15
3262	M 3
3263	E12
3264	C 7
3270	O 3
3271	O 4
3273	N 4
3275	L10
3276	N10
3278	D12
3279	F 6
3280	D 6
3281	M 2
5200	C 4
5205	E 3
6201	F 5
6202	N 3
7200	M 3
7201	C 9
7203	B 6
7204	C 6
7206	H 8
7207	B13
7212	N 4

ELECTRICAL PARTSLIST KARAOKE BOARD

MISCELLANEOUS

1201	4822 267 31792	MICROPHONE SOCKET
1202	4822 267 31792	MICROPHONE SOCKET
1203	4822 276 13614	TACT SWITCH

DIODES

6201	4822 130 30621	1N4148
6202	4822 130 34173	BZX79-B5V6

TRANSISTORS

7200	5322 130 44779	BC338-40
7201	4822 130 44246	BC549C
7203	5322 130 42625	BC559C
7204	4822 130 44246	BC549C
7212	4822 130 44196	BC548C

INTEGRATED CIRCUITS

7206	4822 209 90408	BA3837
7207	4822 209 90407	M65844P

COILS

5200	4822 157 53906	47µH	10%
5205	4822 157 62552	2,2µH	

RESISTORS

3200	4822 116 52256	2k2	5%	0,16W
3201	4822 116 52269	3k3	5%	0,5W
3202	4822 116 52231	820R	5%	0,5W
3203	4822 116 52231	820R	5%	0,5W
3204	4822 116 52269	3k3	5%	0,5W
3205	4822 116 52276	3k9	5%	0,5W
3206	4822 116 52238	12k	5%	0,5W
3209	4822 116 52264	27k	5%	0,5W
3213	4822 116 52271	33k	5%	0,16W
3214	4822 116 52271	33k	5%	0,16W
3215	4822 116 52271	33k	5%	0,16W
3216	4822 116 52191	33R	5%	0,5W
3217	4822 116 52271	33k	5%	0,16W
3218	4822 116 52271	33k	5%	0,16W
3219	4822 116 52271	33k	5%	0,16W
3220	4822 116 52284	47k	5%	0,5W
3221	4822 116 52264	27k	5%	0,5W
3222	4822 116 83874	220k	5%	0,5W
3223	4822 116 83874	220k	5%	0,5W
3224	4822 116 83874	220k	5%	0,5W
3243	4822 050 11002	1k	5%	0,2W
3244	4822 050 11002	1k	5%	0,2W
3245	4822 050 11002	1k	5%	0,2W
3246	4822 116 52263	2k7	5%	0,5W
3247	4822 116 83874	220k	5%	0,5W
3248	4822 116 52264	27k	5%	0,5W
3249	4822 116 52224	470R	5%	0,5W
3250	4822 116 52244	15k	5%	0,5W
3251	4822 116 52263	2k7	5%	0,5W
3252	4822 116 83864	10k	5%	0,5W
3253	4822 116 52289	5k6	5%	0,16W
3254	4822 116 52296	6k8	5%	0,5W
3255	4822 116 83882	39k	5%	0,5W
3256	4822 116 52257	22k	5%	0,5W
3257	4822 116 52213	180R	5%	0,5W
3258	4822 116 52234	100k	5%	0,5W
3260	4822 116 52213	180R	5%	0,5W

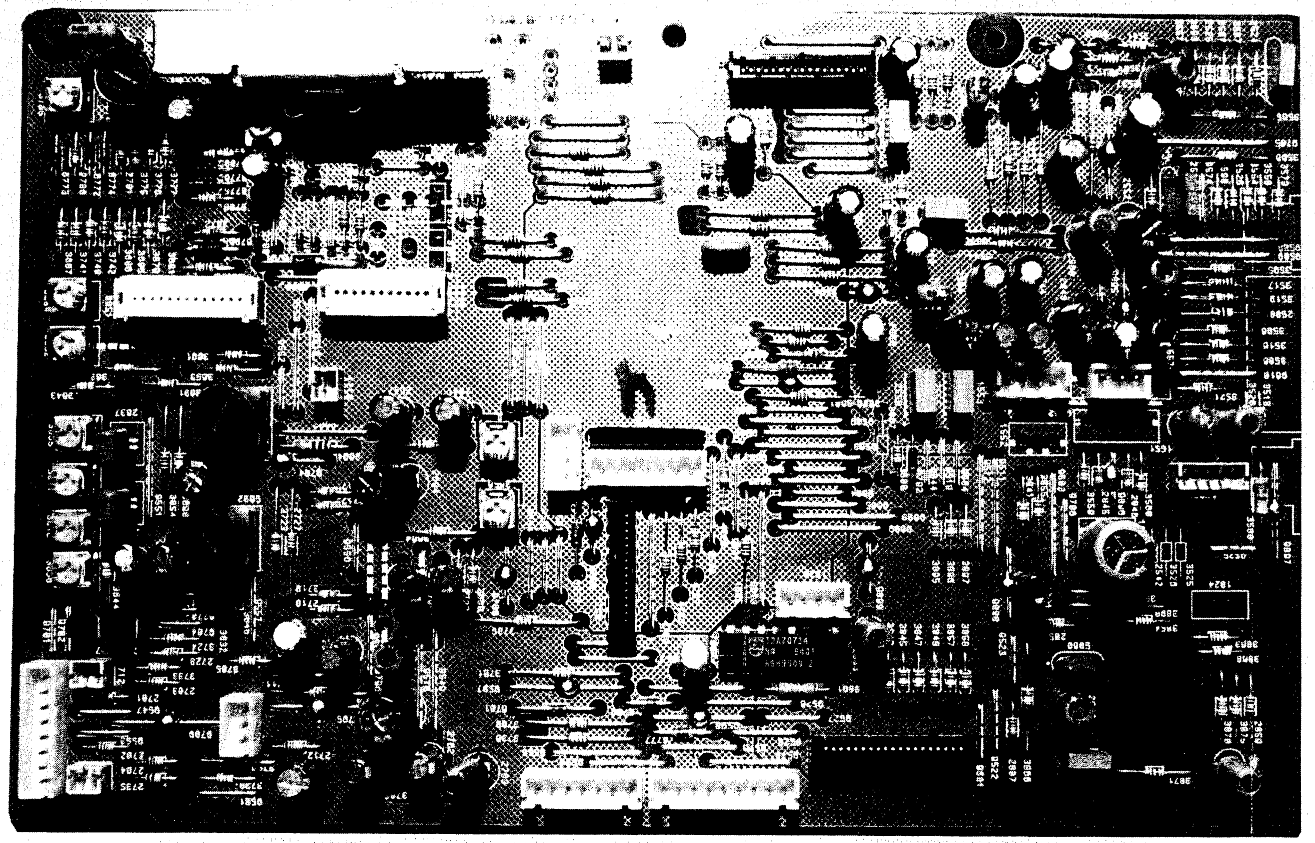
RESISTORS

3261	4822 050 24708	4R7	1%	0,6W
3262	4822 116 52175	100R	5%	0,5W
3263	4822 100 12268	20k	POTMETER	
3264	4822 100 12268	20k	POTMETER	
3270	4822 116 52297	68k	5%	0,5W
3271	4822 116 52284	47k	5%	0,5W
3273	4822 050 11002	1k	5%	0,2W
3275	4822 116 52298	680k	5%	0,5W
3275	4822 116 52298	680k	5%	0,5W
3276	4822 116 52285	470k	5%	0,5W
3278	4822 116 52303	8k2	5%	0,5W
3279	4822 116 52234	100k	5%	0,5W
3280	4822 116 83864	10k	5%	0,5W
3281	4822 116 52195	47R	5%	0,5W

CAPACITORS

2200	4822 124 41579	10µF	20%	50V
2201	4822 124 41579	10µF	20%	50V
2201	4822 124 41579	10µF	20%	50V
2202	4822 124 40433	47µF	20%	25V
2203	4822 124 41997	470µF	20%	10V
2204	4822 124 41579	10µF	20%	50V
2205	4822 124 40242	1µF	20%	63V
2206	4822 124 40746	0,22µF	20%	63V
2207	4822 124 40746	0,22µF	20%	63V
2208	4822 124 40433	47µF	20%	25V
2209	4822 124 41997	470µF	20%	10V
2210	4822 124 41579	10µF	20%	50V
2211	4822 126 12882	100nF	20%	50V
2212	4822 126 12882	100nF	20%	50V
2213	4822 126 12882	100nF	20%	50V
2218	4822 124 41579	10µF	20%	50V
2219	4822 124 41579	10µF	20%	50V
2220	4822 124 41579	10µF	20%	50V
2221	4822 124 40242	1µF	20%	63V
2222	4822 122 33197	1nF	10%	50V
2223	4822 124 41579	10µF	20%	50V
2224	4822 124 41407	0,47µF	20%	63V
2225	4822 124 40849	330µF	20%	16V
2233	4822 126 12339	2,2nF	10%	16V
2234	5322 121 42386	100nF	5%	63V
2235	4822 126 12339	2,2nF	10%	16V
2236	5322 121 42386	100nF	5%	63V
2237	4822 121 51387	10nF	20%	16V
2238	4822 124 40242	1µF	20%	63V
2239	4822 122 33195	100pF	10%	50V
2240	4822 122 33195	100pF	10%	50V
2241	4822 121 51387	10nF	20%	16V
2242	4822 124 40746	0,22µF	20%	63V
2243	4822 121 43526	47nF	5%	100V
2252	4822 126 12572	6,8pF	5%	50V
2253	4822 122 33197	1nF	10%	50V
2254	4822 122 33195	100pF	10%	50V
2255	4822 122 33195	100pF	10%	50V
2256	4822 122 33195	100pF	10%	50V
2257	4822 122 33169	680pF	10%	50V
2258	4822 122 33195	100pF	10%	50V
2260	4822 124 41579	10µF	20%	50V
2261	4822 124 41579	10µF	20%	50V
2262	4822 124 41579	10µF	20%	50V
2263	4822 124 41997	470µF	20%	10V

Remarks



COMBI BOARD

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Functional Diagram CD 9-3
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Adjustment Table Tape 9-5
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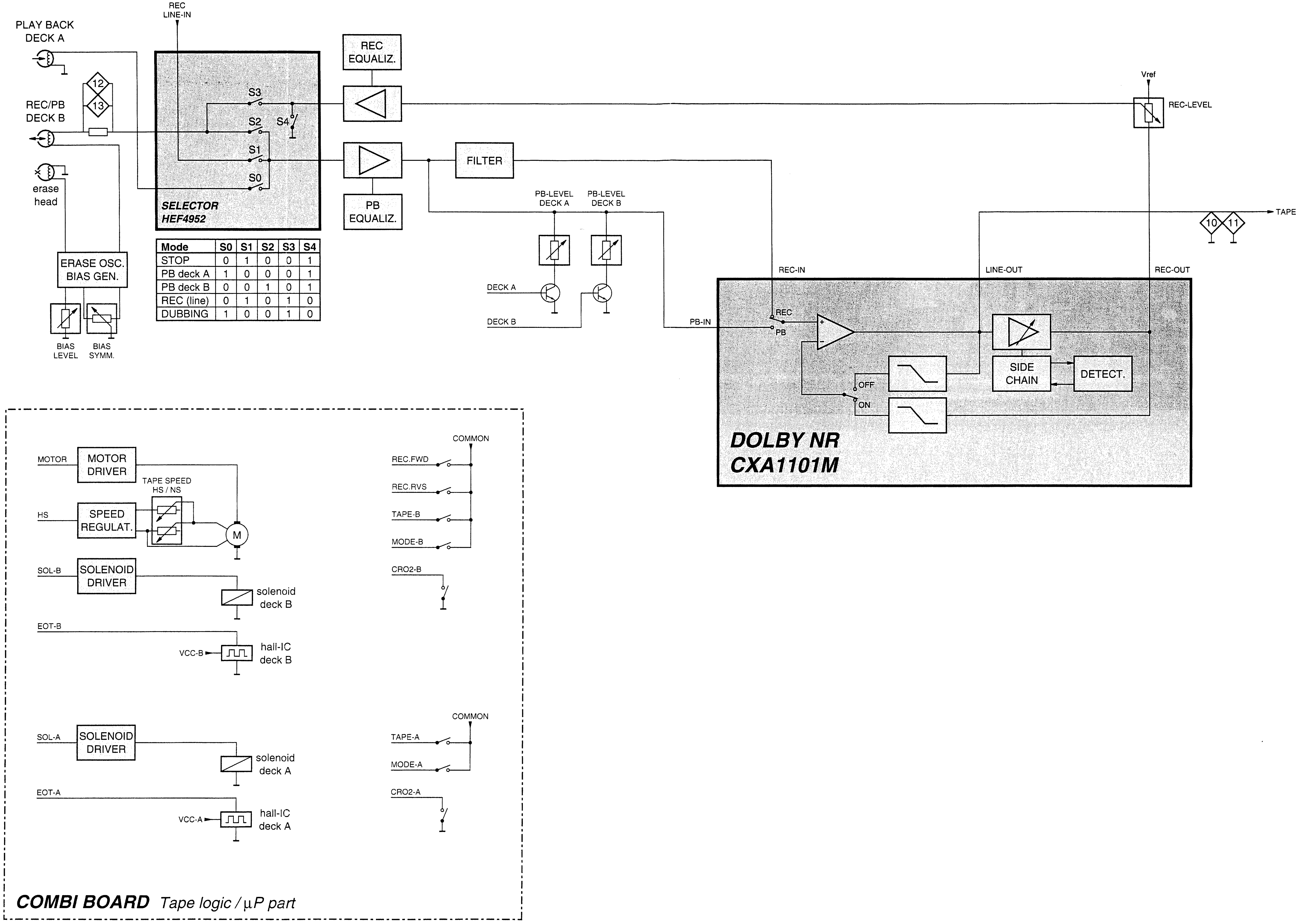
Component Layout combi board 9-11
Circuit Diagram Combi AF-part 9-13
Partslist...9-14

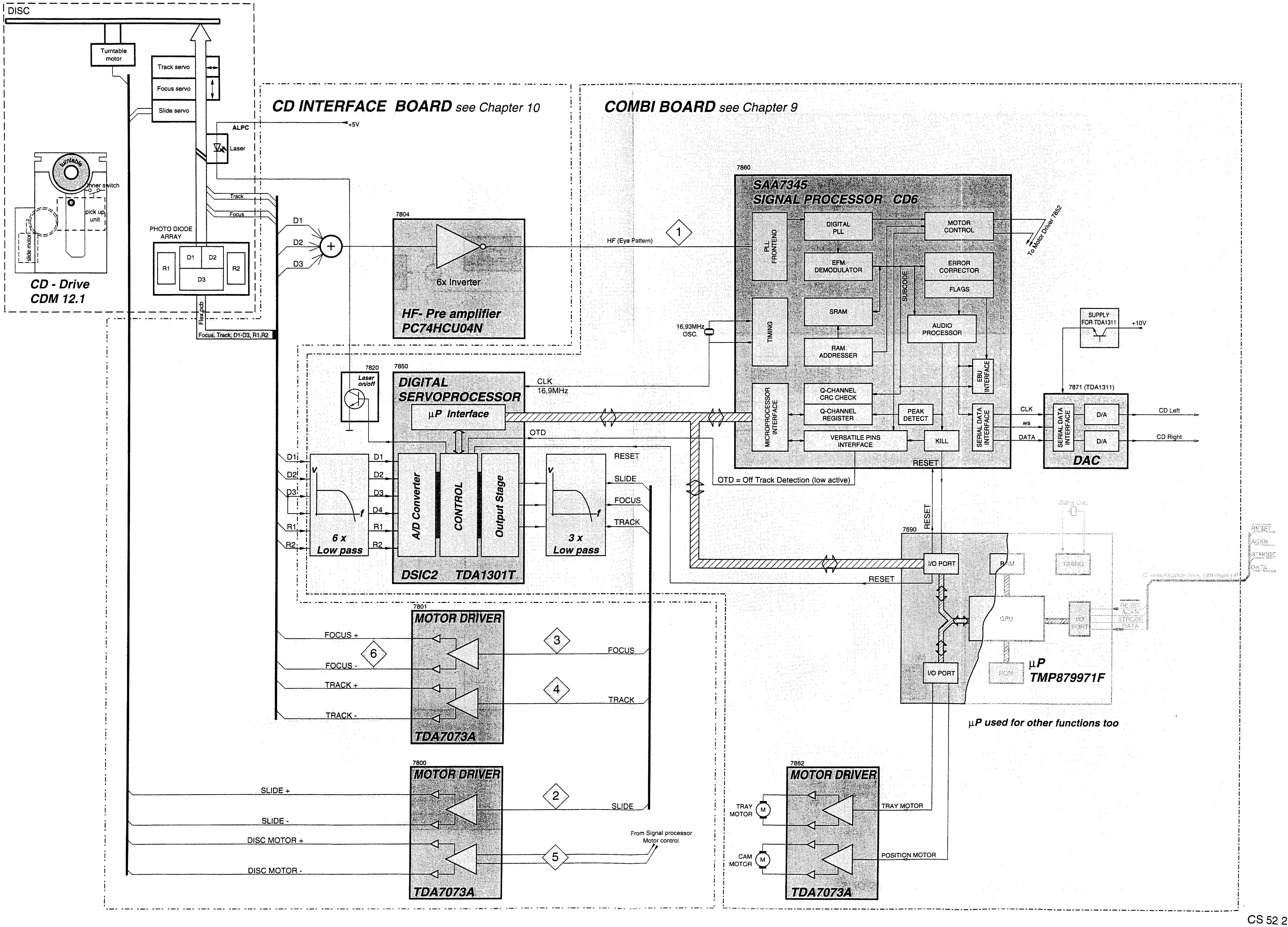
Remarks

FUNCTIONAL DIAGRAM TAPE PART

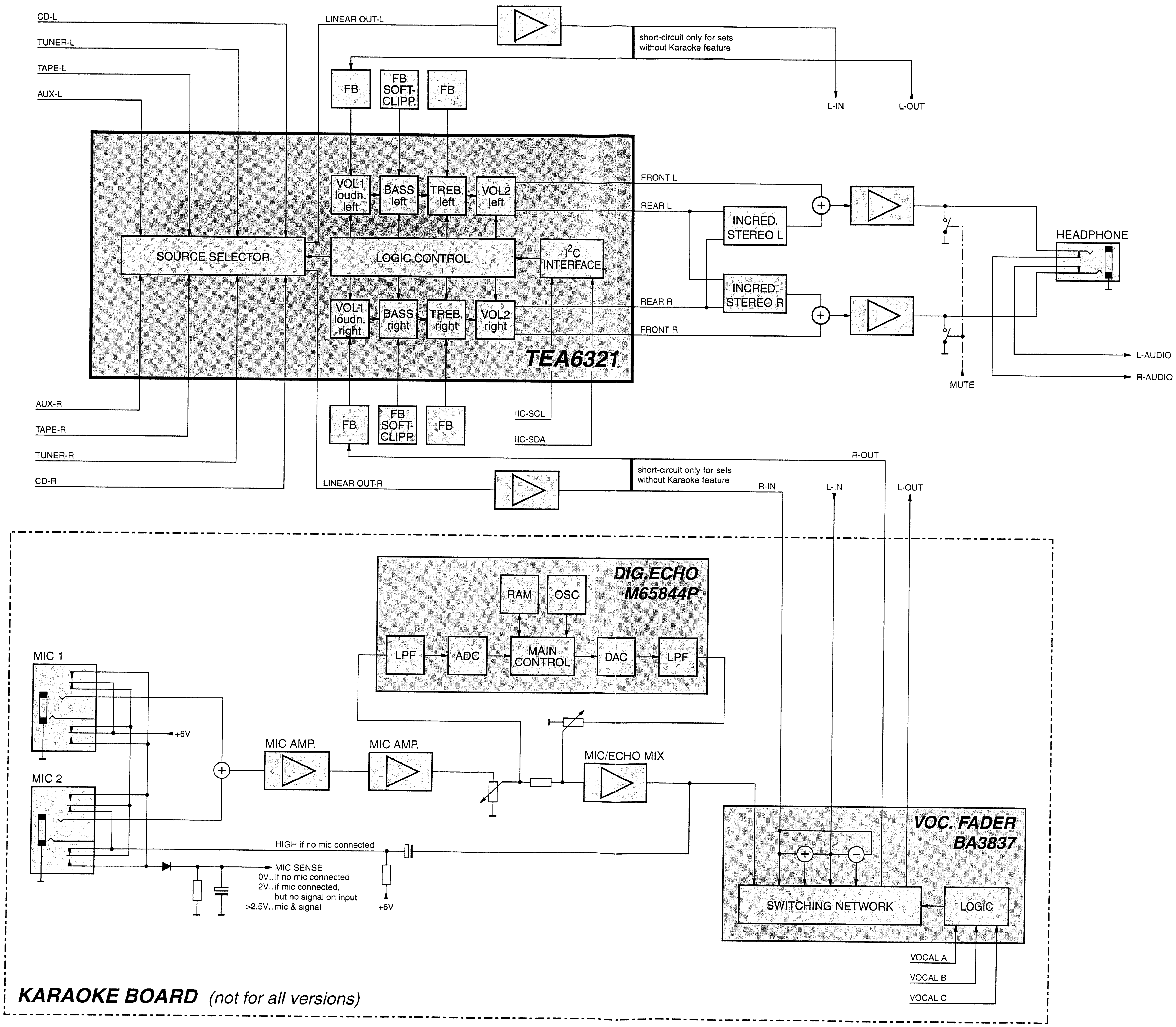

REC
LINE-IN
PLAY BACK
DECK A
REC/PB
DECK B
12
13
erase
head
ERASE OSC.
BIAS GEN.
BIAS
LEVEL
BIAS
SYMM.
S3
S2
S4
S1
S0
SELECTOR
HEF4952
REC
EQUALIZ.
PB
EQUALIZ.
FILTER
PB-LEVEL
DECK A
PB-LEVEL
DECK B
DECK A
DECK B
Vref
REC-LEVEL
TAPE
10
11
REC-IN
LINE-OUT
REC-OUT
PB-IN
REC
PB
OFF
ON
SIDE
CHAIN
DETECT.
DOLBY NR
CXA1101M
MOTOR
MOTOR
DRIVER
TAPE SPEED
HS / NS
HS
SPEED
REGULAT.
M
SOL-B
SOLENOID
DRIVER
solenoid
deck B
EOT-B
VCC-B
hall-IC
deck B
SOL-A
SOLENOID
DRIVER
solenoid
deck A
EOT-A
VCC-A
hall-IC
deck A
COMMON
REC.FWD
REC.RVS
TAPE-B
MODE-B
CRO2-B
COMMON
TAPE-A
MODE-A
CRO2-A
COMBI BOARD Tape logic / µP part

Mode	S0	S1	S2	S3	S4
STOP	0	1	0	0	1
PB deck A	1	0	0	0	1
PB deck B	0	0	1	0	1
REC (line)	0	1	0	1	0
DUBBING	1	0	0	1	0

FUNCTIONAL DIAGRAM CD-PART


DISC
Turntable motor
Track servo
Focus servo
Slide servo
ALPC
Laser
+5V
turntable
inner switch
pick up unit
slide motor
PHOTO DIODE ARRAY
D1
D2
D3
R1
R2
Track
Focus
Flex pcb
Focus, Track, D1-D3, R1,R2
CD - Drive
CDM 12.1
CD INTERFACE BOARD see Chapter 10
COMBI BOARD see Chapter 9
7804
6x Inverter
HF- Pre amplifier
PC74HCU04N
HF (Eye Pattern)
1
7860
SAA7345
SIGNAL PROCESSOR CD6
PLL FRONTEND
DIGITAL PLL
MOTOR CONTROL
To Motor Driver 7852
EFM DEMODULATOR
ERROR CORRECTOR
FLAGS
SUBCODE
SRAM
AUDIO PROCESSOR
TIMING
RAM ADDRESSER
16,93MHz OSC.
EBU INTERFACE
MICROPROCESSOR INTERFACE
Q-CHANNEL CRC CHECK
Q-CHANNEL REGISTER
PEAK DETECT
VERSATILE PINS INTERFACE
KILL
SERIAL DATA INTERFACE
RESET
SUPPLY FOR TDA1311
+10V
7871 (TDA1311)
CLK
ws
DATA
SERIAL DATA INTERFACE
D/A
D/A
CD Left
CD Right
DAC
7820
Laser on/off
7850
DIGITAL SERVOPROCESSOR
µP Interface
CLK 16,9MHz
OTD
OTD = Off Track Detection (low active)
D1
D2
D3
D4
R1
R2
6 x Low pass
A/D Converter
CONTROL
Output Stage
3 x Low pass
RESET
SLIDE
FOCUS
TRACK
DSIC2 TDA1301T
RESET
7690
I/O PORT
RAM
TIMING
8MHz Osc.
CPU
I/O PORT
ROM
I/O PORT
RESET
ACKN
STROBE
DATA
Communication lines with main µP
µP
TMP879971F
µP used for other functions too
7801
MOTOR DRIVER
FOCUS +
FOCUS -
TRACK +
TRACK -
6
3
4
FOCUS
TRACK
TDA7073A
7800
MOTOR DRIVER
SLIDE +
SLIDE -
DISC MOTOR +
DISC MOTOR -
2
5
SLIDE
From Signal processor Motor control
TDA7073A
7862
MOTOR DRIVER
TRAY MOTOR
CAM MOTOR
M
TRAY MOTOR
POSITION MOTOR
TDA7073A

FUNCTIONAL DIAGRAM AF-PART


CD-L
TUNER-L
TAPE-L
AUX-L
LINEAR OUT-L
short-circuit only for sets without Karaoke feature
L-IN
L-OUT
FB
FB SOFT-CLIPP.
FB
VOL1 loudn. left
BASS left
TREB. left
VOL2 left
SOURCE SELECTOR
LOGIC CONTROL
I²C INTERFACE
VOL1 loudn. right
BASS right
TREB. right
VOL2 right
TEA6321
FRONT L
REAR L
REAR R
FRONT R
INCRED. STEREO L
INCRED. STEREO R
HEADPHONE
L-AUDIO
R-AUDIO
MUTE
AUX-R
TAPE-R
TUNER-R
CD-R
FB
FB SOFT-CLIPP.
FB
IIC-SCL
IIC-SDA
R-OUT
short-circuit only for sets without Karaoke feature
LINEAR OUT-R
R-IN
L-IN
L-OUT
DIG.ECHO M65844P
RAM
OSC
LPF
ADC
MAIN CONTROL
DAC
LPF
MIC 1
+6V
MIC 2
MIC AMP.
MIC AMP.
MIC/ECHO MIX
HIGH if no mic connected
MIC SENSE
0V.. if no mic connected
2V.. if mic connected, but no signal on input
>2.5V.. mic & signal
+6V
VOC. FADER BA3837
SWITCHING NETWORK
LOGIC
VOCAL A
VOCAL B
VOCAL C
KARAOKE BOARD (not for all versions)

General

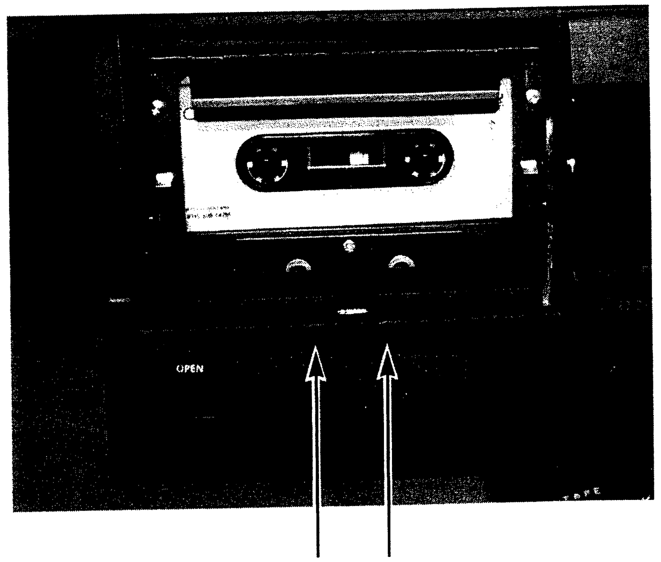
	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇10 or ◇11 LEFT RIGHT	frequency counter	3682	5670Hz ±0.5%
NORMAL SPEED		PLAY			3684	3150Hz ±0.5%
CHECK WOW & FLUTTER (DECK1 AND DECK2)						
WOW & FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY	◇10 or ◇11 LEFT RIGHT	W&F-meter	check only	≤0.35% unwtd.
ADJUST AZIMUTH (DECK1 AND DECK2)						
NORM. DIRECTION	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇10 & ◇11 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
REV. DIRECTION		PLAY REV			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST PLAYBACK LEVEL						
DECK1	DOLBY REF. (4822 397 30071) 200nWb/m	PLAY	◇10 & ◇11 LEFT RIGHT	mV-meter	3635(L), 3636(R)	535mV ±0.5dB
DECK2					3641(L), 3642(R)	
CHECK PLAYBACK FREQUENCY RESPONSE (DECK1 AND DECK2)						
PB FREQU. RESP.	SBC420 (4822 397 30071)	PLAY	◇10 & ◇11 LEFT RIGHT	mV-meter	check only	limits see fig.1

AZIMUTH ALIGNMENT

Remove ornamental part of cassette door.
For alignment use a small cross slot screwdriver.



Record

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
CrO_2	CrO_2	RECORD	◇12 & ◇13 LEFT RIGHT	mV-meter	3773 & 3785	110mV & left=right
FERRO	FERRO	RECORD			check only	71mV ±0.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
37mV at AUX-IN, 100Hz,250Hz,1kHz, 10kHz,12.5kHz	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇10 & ◇11 LEFT RIGHT	mV-meter	check only	limits see fig.2
100mV at AUX-IN, 1kHz	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇10 & ◇11 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and remeasure. If distortion is too high increase bias and remeasure.						
ADJUST RECORD LEVEL						
AUX-IN	CrO_2	RECORD	◇10 & ◇11 LEFT RIGHT	mV-meter	LF-generator	330Hz 170mV
	CrO_2	RECORD	◇12 & ◇13 LEFT RIGHT	mV-meter	3655 & 3556	5mV [1]
[1] Remark: Use low pass filter to attenuate the bias component, or short-circuit base of 7783 to ground.						
RECORD LEVEL						
	RECORDED CASSETTE	PLAY	◇10 & ◇11 LEFT RIGHT	mV-meter	check only	330Hz 170mV ±0.5dB
Remark: If measured value is out of limit, re-adjust record level and remeasure.						

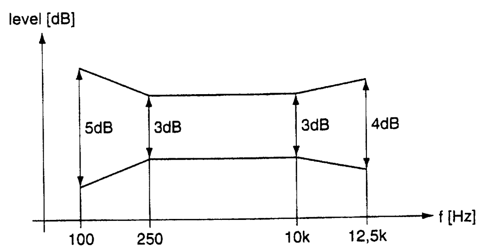


fig.1

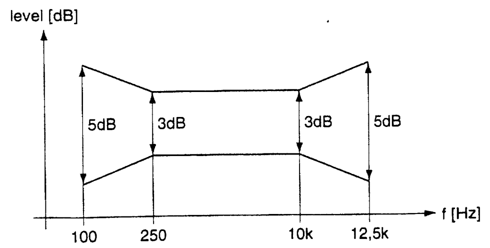
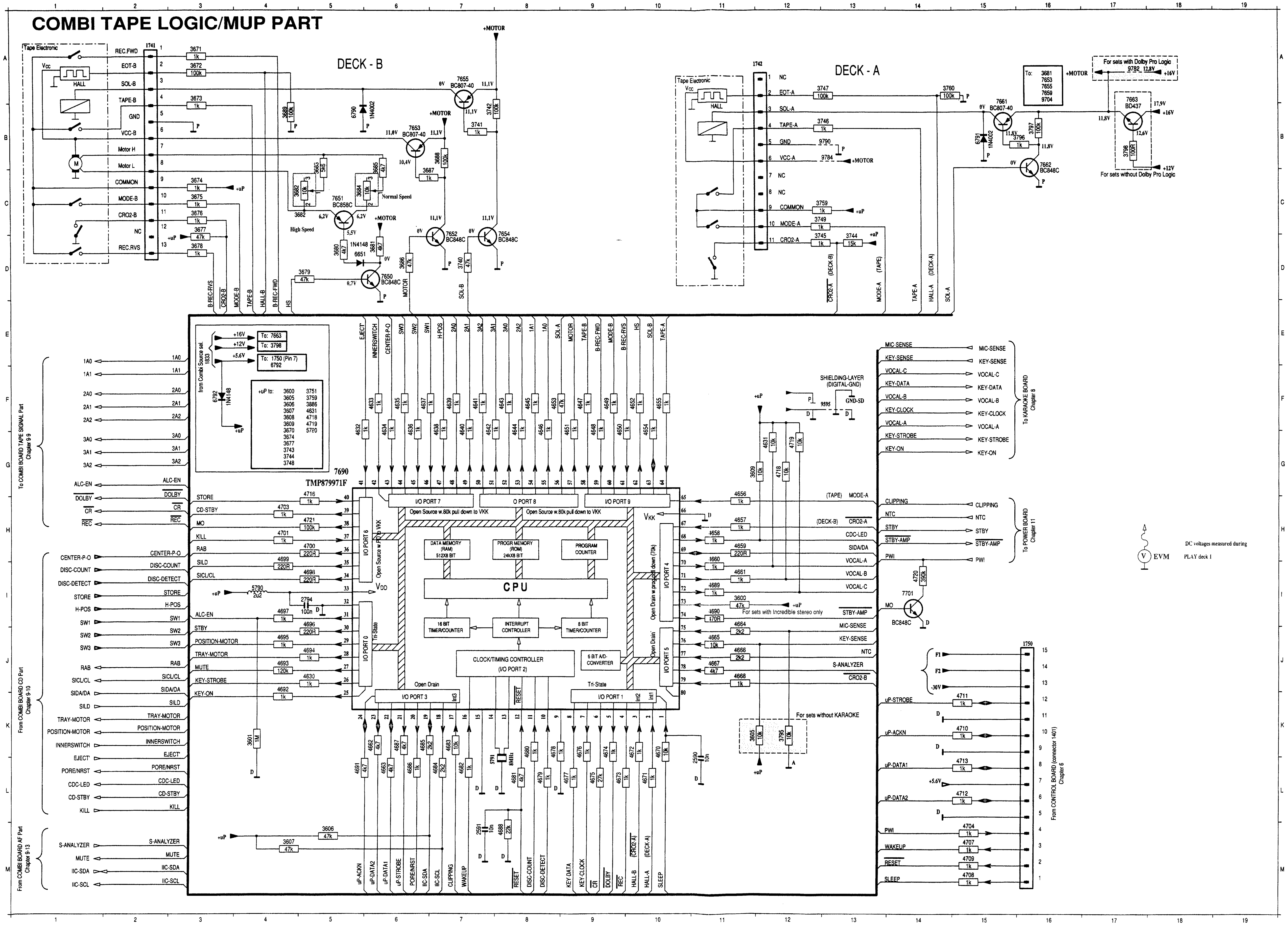


fig.2

COMBI TAPE LOGIC/MUP PART


DECK - B
DECK - A
Tape Electronic
HALL
REC.FWD
EOT-B
SOL-B
TAPE-B
GND
VCC-B
Motor H
Motor L
COMMON
MODE-B
CRO2-B
NC
REC.RVS
1741
1742
+MOTOR
7655 BC807-40
7653 BC807-40
7651 BC858C
7652 BC848C
7654 BC848C
7650 BC848C
6790 1N4002
6651 1N4148
High Speed
Normal Speed
EOT-A
SOL-A
TAPE-A
VCC-A
MODE-A
CRO2-A
7661 BC807-40
7662 BC848C
7663 BD437
For sets with Dolby Pro Logic
For sets without Dolby Pro Logic
7690
TMP879971F
I/O PORT 7
O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 512X8 BIT
PROGR MEMORY (ROM) 24KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
8 BIT A/D-CONVERTER
Open Source w.80k pull down to VKK
Open Drain
Tri-State
5790 2u2
5791 8MHz
SHIELDING-LAYER (DIGITAL-GND)
9595
GND-SD
For sets with Incredible stereo only
For sets without KARAOKE
7701 BC848C
1750
To COMBI BOARD TAPE SIGNAL Part Chapter 9-9
From COMBI BOARD CD Part Chapter 9-10
From COMBI BOARD AF Part Chapter 9-13
To KARAOKE BOARD Chapter 8
To POWER BOARD Chapter 11
From CONTROL BOARD (connector 1401) Chapter 6
from Combi Source sel. 1833
EVM
DC voltages measured during PLAY deck I

1741	A 2
1742	A12
1750	J16
2590	L11
2591	M 7
2794	I 5
3600	I11
3601	K 4
3605	K11
3606	M 5
3607	M 4
3608	L11
3609	G11
3671	A 3
3672	A 3
3673	A 3
3674	C 3
3675	C 3
3676	C 3
3677	C 3
3678	D 3
3679	D 5
3680	D 5
3681	D 6
3682	C 4
3683	B 5
3684	C 5
3685	B 6
3687	C 6
3688	B 7
3689	B 4
3740	D 7
3741	B 7
3742	B 7
3744	D13
3745	D12
3746	B13
3747	A13
3748	A 8
3749	C12
3759	C13
3760	B14
3795	K12
3796	B15
3797	A16
3798	B17
3886	K 4
4630	J 5
4631	G12
4632	F 5
4633	F 6
4634	F 6
4635	F 6
4636	F 6
4637	F 6
4638	F 7
4639	F 7
4640	F 7
4641	F 7
4642	F 7
4643	F 8
4644	F 8
4645	F 8
4646	F 8
4647	F 9
4648	F 9
4649	F 9
4650	F 9
4651	F 9
4652	F10
4653	F 8
4654	F10
4655	F10
4656	G11
4657	H11
4658	H11
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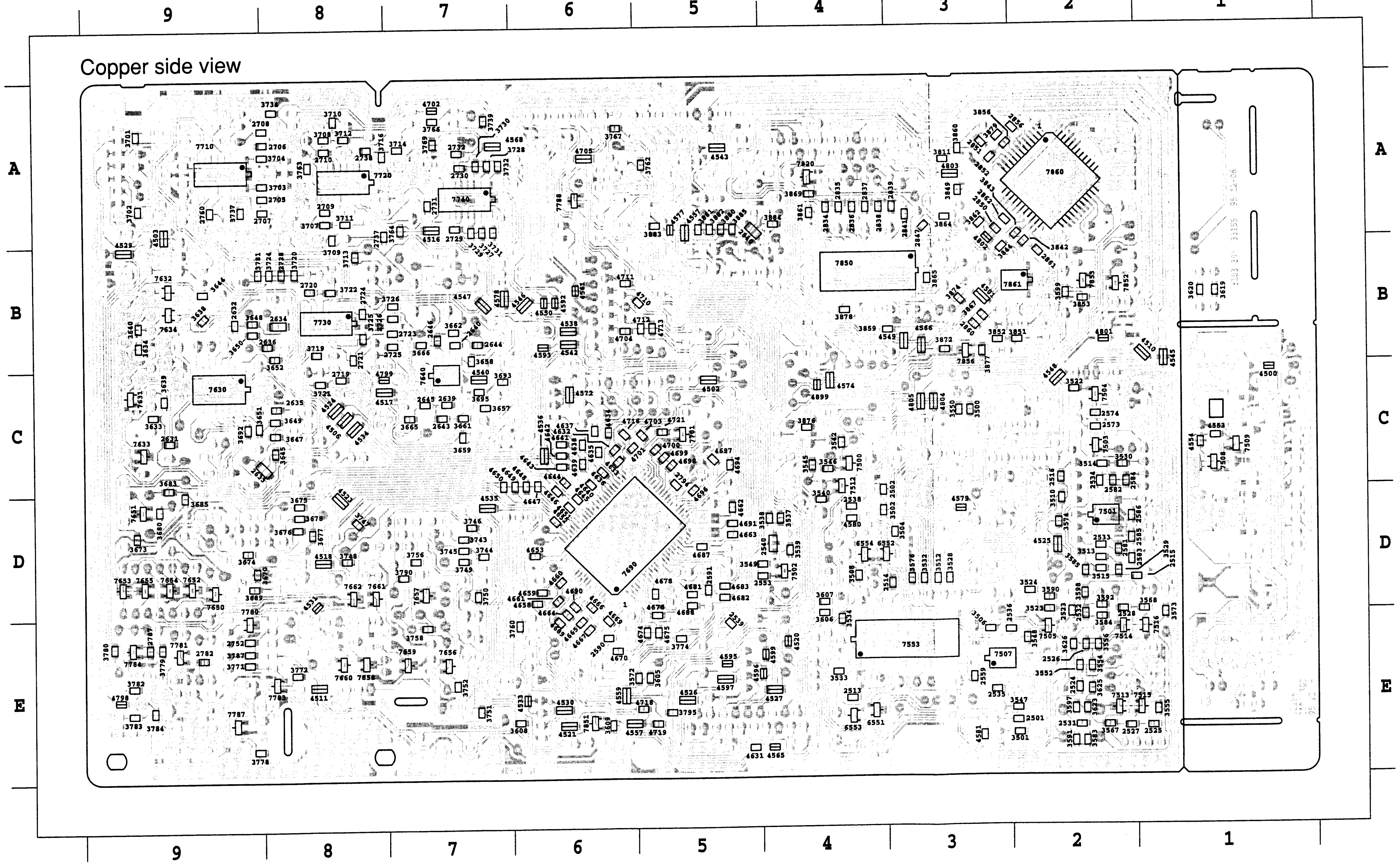

Copper side view

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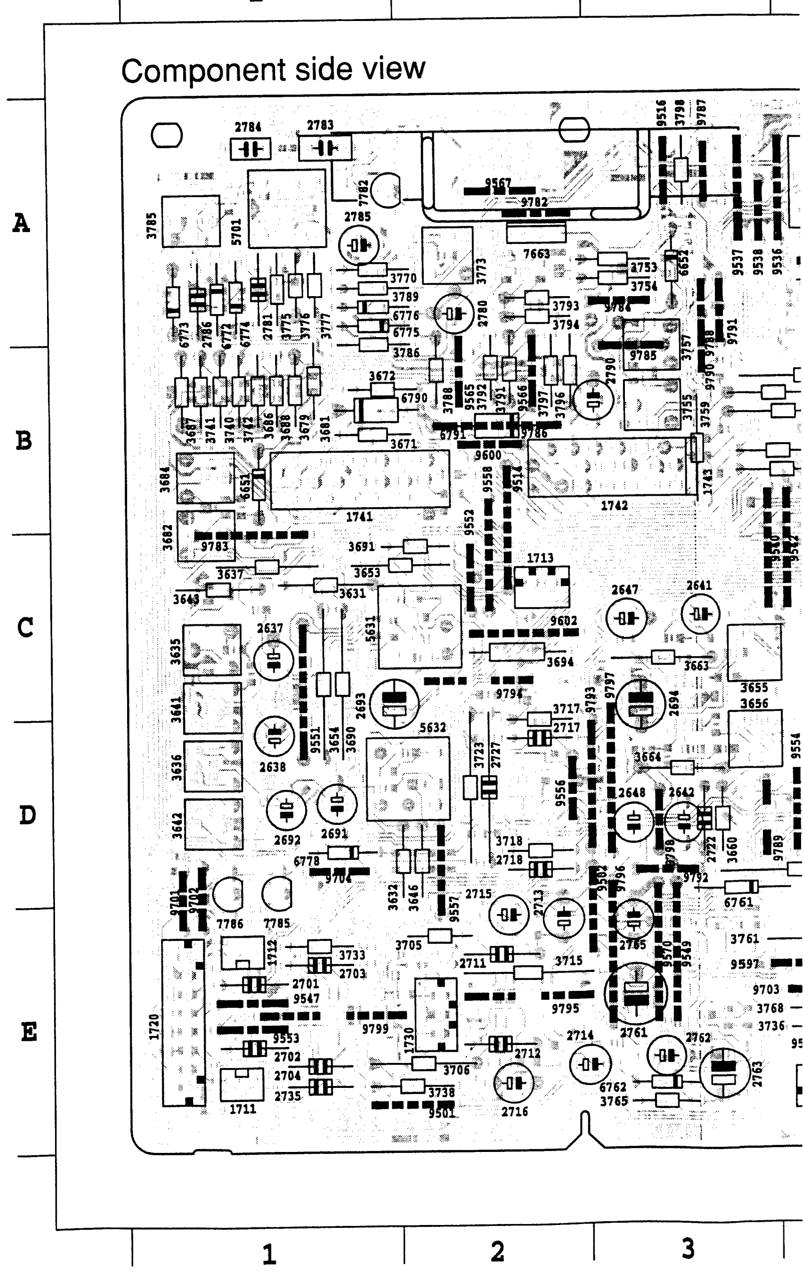

Component side view

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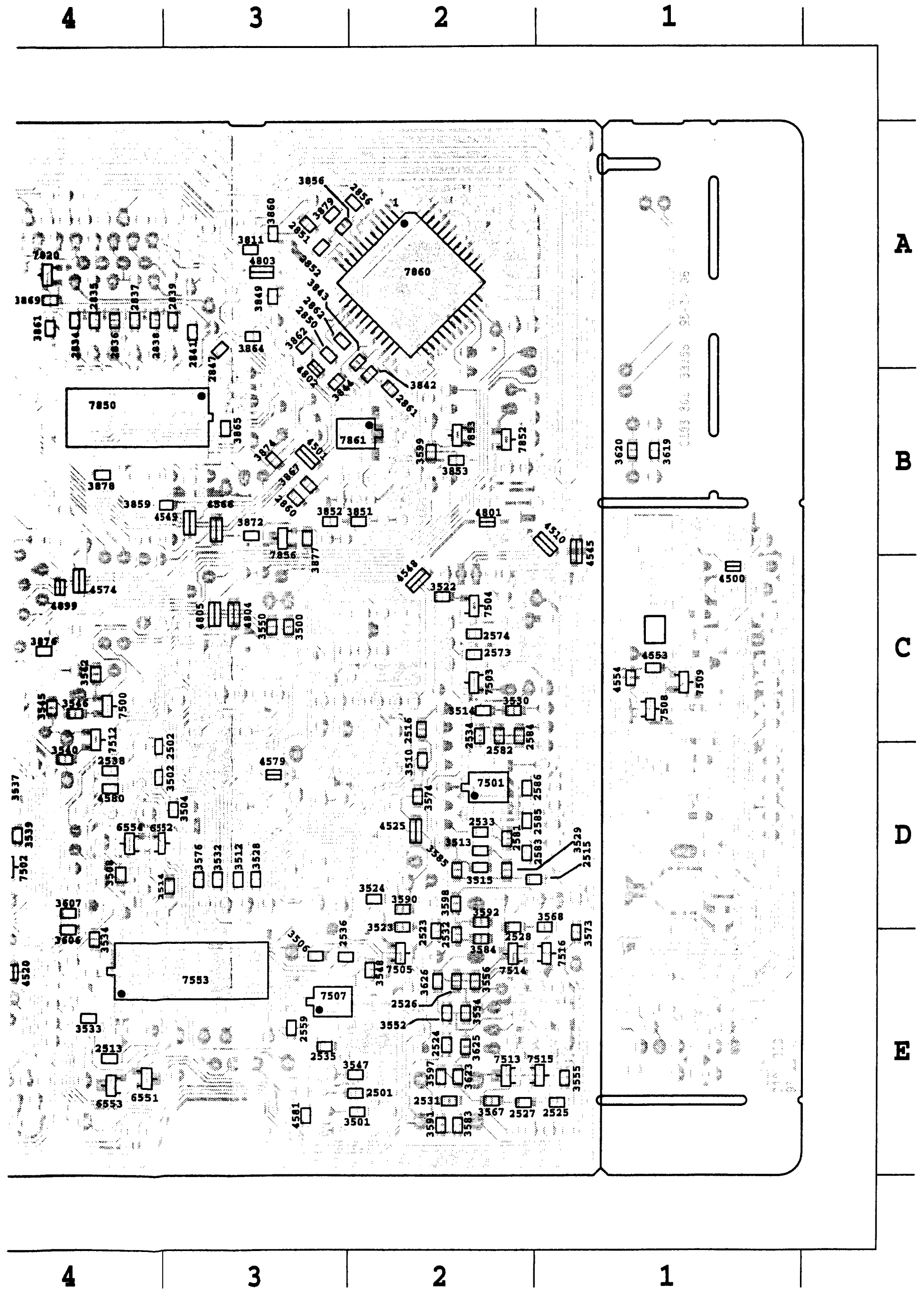

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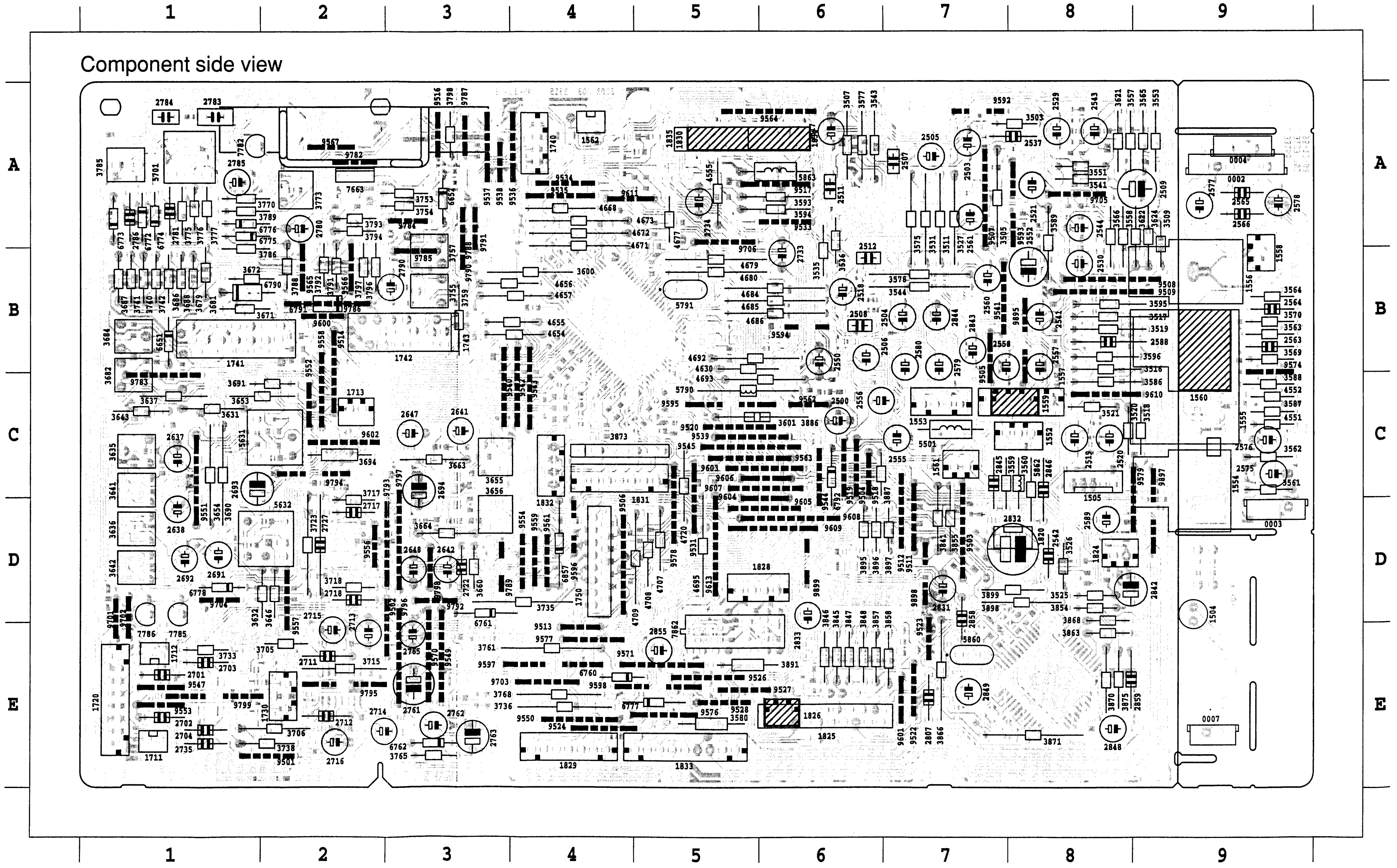
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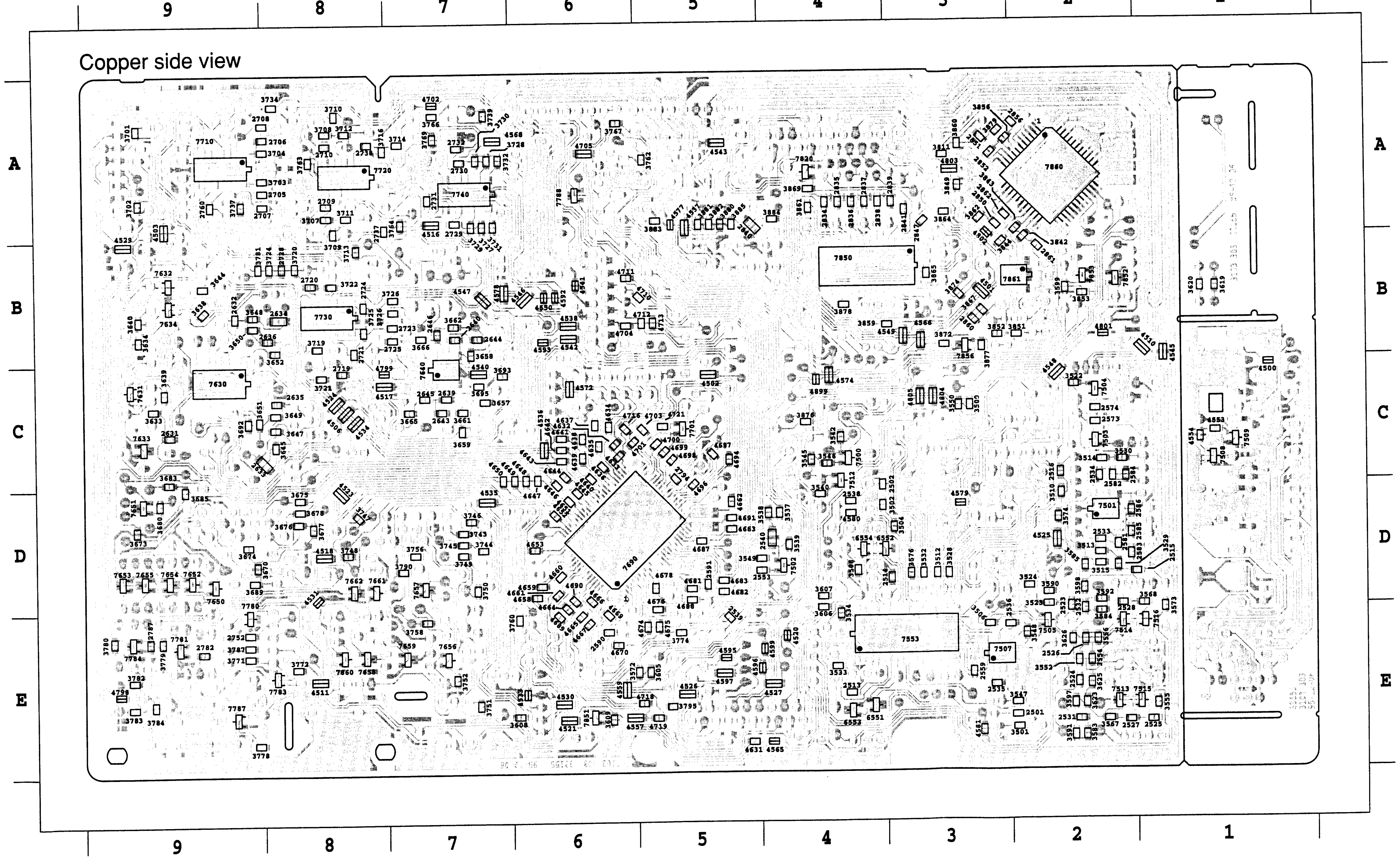
Copper side view



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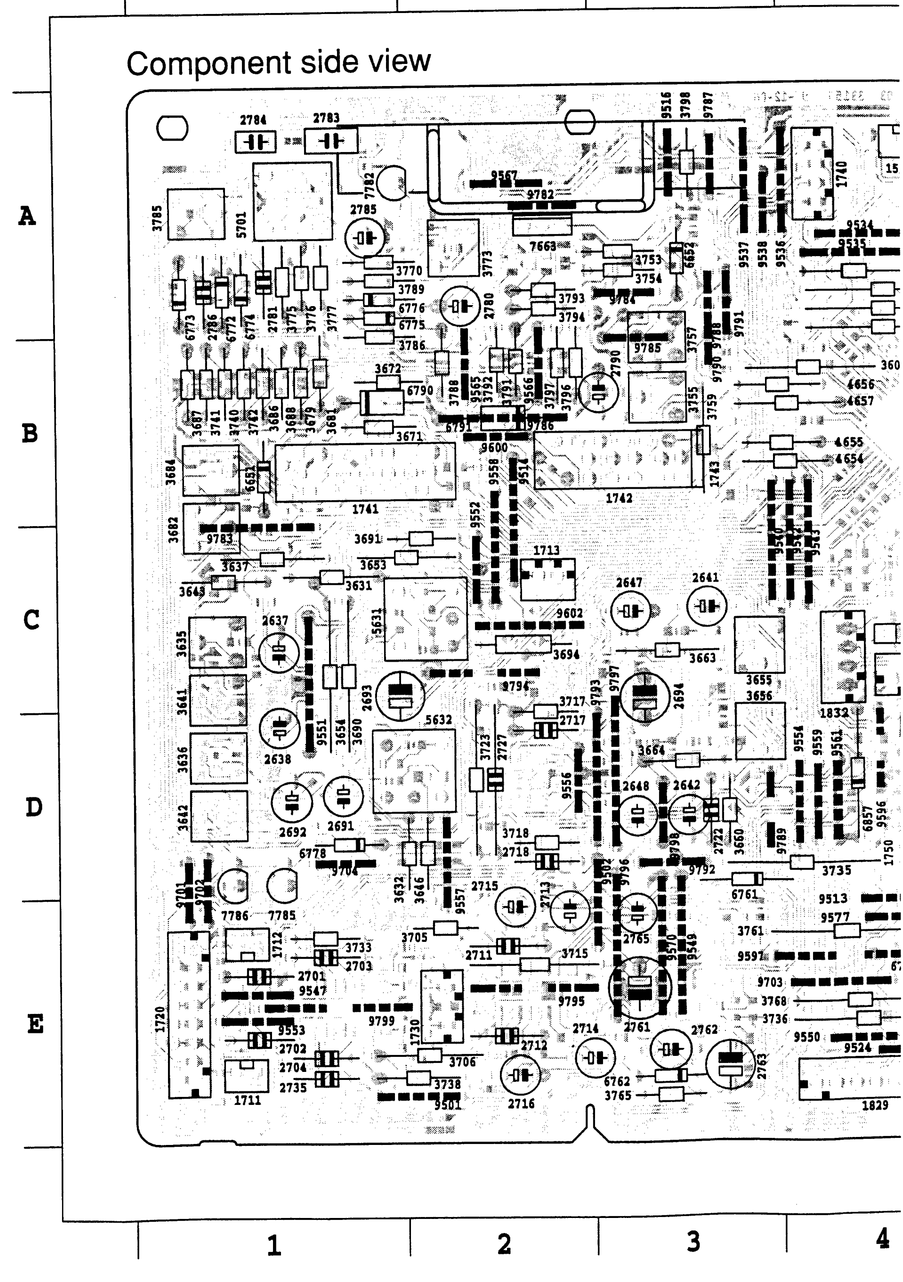

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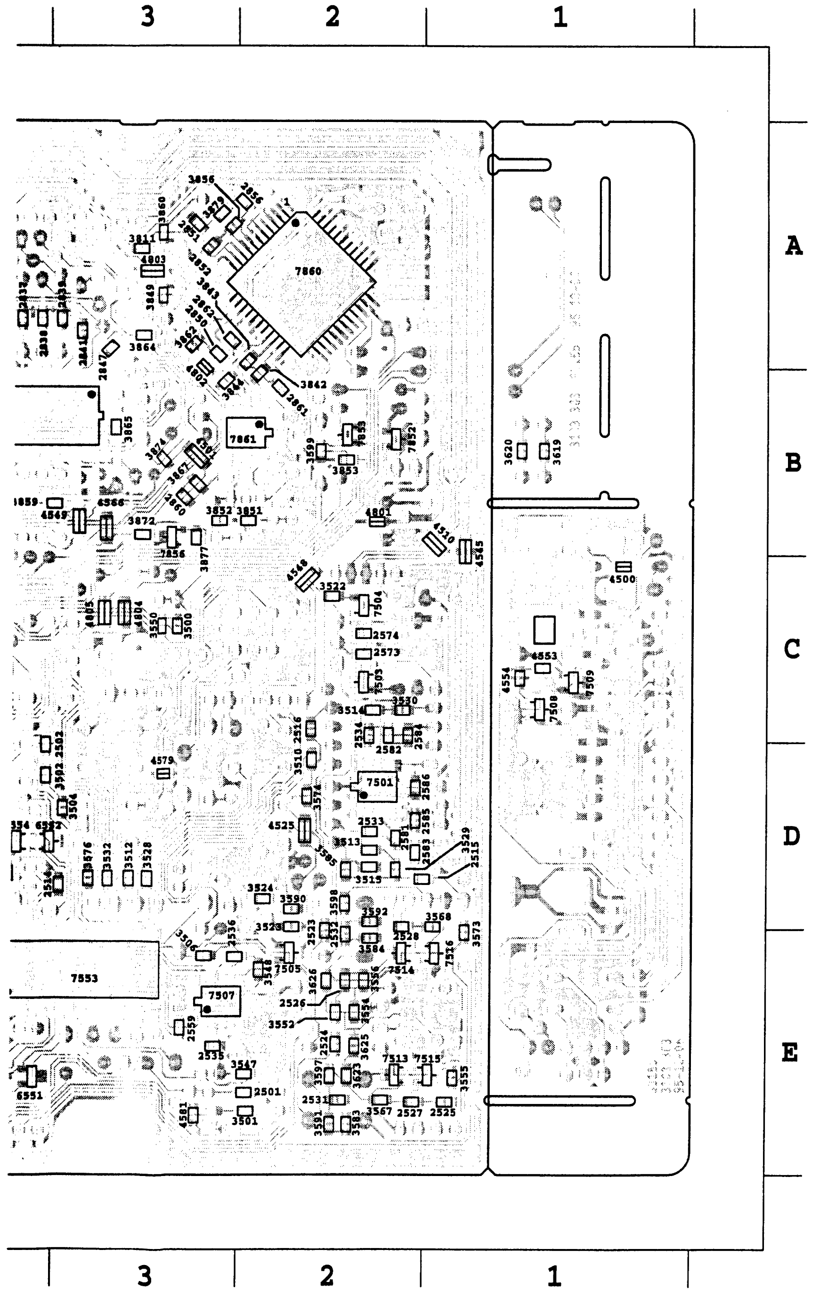

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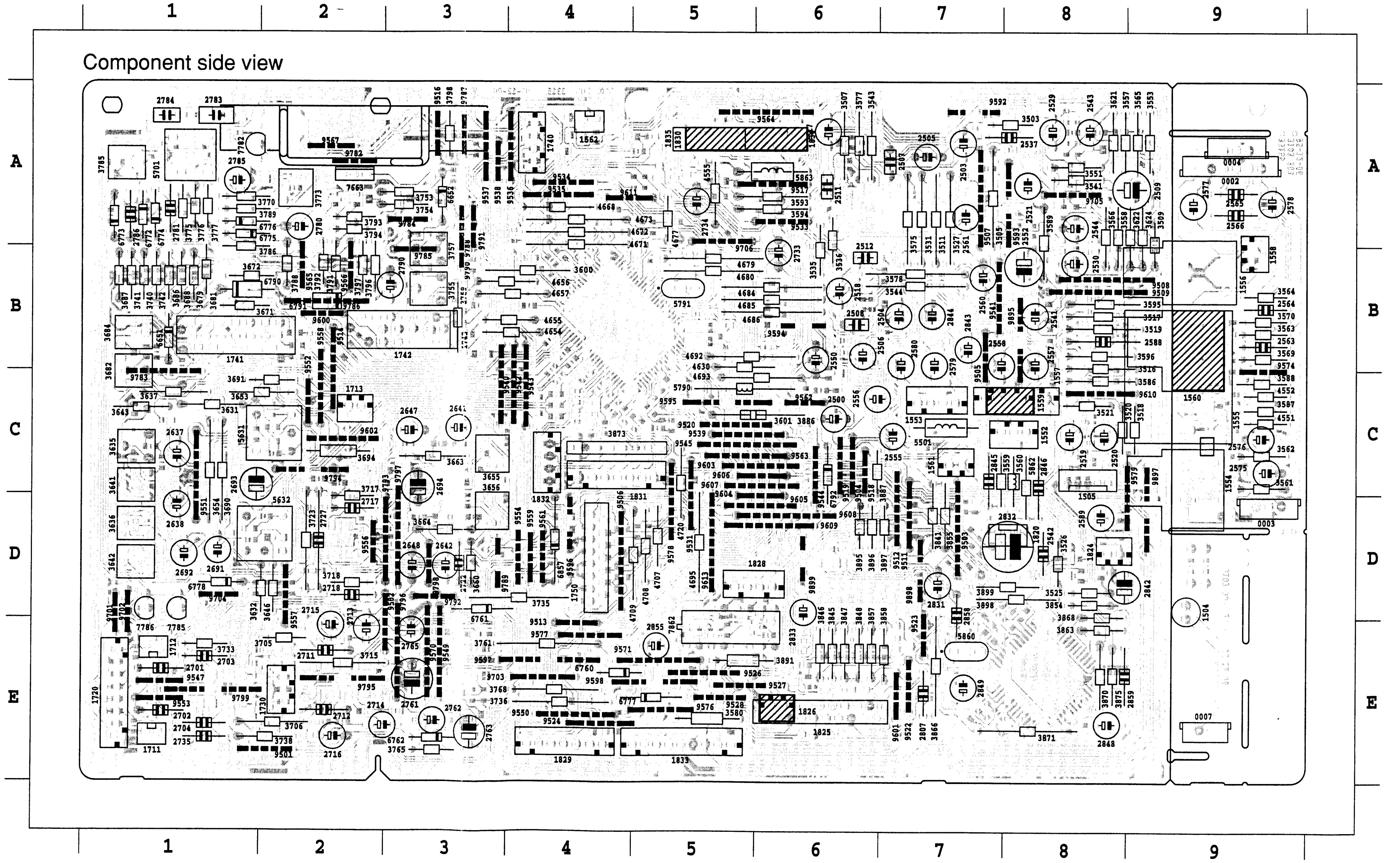
1560 B 9	1831 C 4	2529 A 8	2576 C 9	2704 E 1	2783 A 1	3505 A 7	3553 A 9	3589 A 8	3654 C 1	3715 E 2	3773 A 2	3854 D 8	4552 C 9	4707 D 5	6774 A 1	9507 A 7	9534 A 4	9557 D 2	9595 C 5	9704 D 1	9799 E 1
1561 C 7	1832 C 4	2530 B 8	2577 A 9	2711 E 2	2784 A 1	3507 A 6	3557 A 8	3593 A 6	3655 C 3	3717 D 2	3775 A 1	3855 D 7	4555 A 5	4708 D 5	6775 A 1	9508 B 8	9535 A 4	9558 C 2	9596 D 4	9705 A 8	9895 B 8
1562 A 4	1833 E 5	2537 A 8	2578 A 9	2712 E 2	2785 A 1	3509 A 9	3558 A 8	3594 A 6	3656 D 3	3718 D 2	3776 A 1	3857 E 6	4630 B 5	4709 D 5	6776 A 1	9509 B 8	9536 A 4	9559 D 4	9597 E 4	9706 A 5	9897 D 9
1711 E 1	1834 A 5	2541 B 8	2579 B 7	2713 E 2	2786 A 1	3511 A 7	3559 C 7	3595 B 8	3660 D 3	3723 D 2	3777 A 1	3858 E 7	4654 B 4	4720 C 5	6777 E 5	9511 D 7	9537 A 3	9561 D 4	9598 E 5	9782 A 2	9898 D 7
1712 E 1	1835 A 5	2542 D 8	2580 B 7	2714 E 2	2790 B 3	3516 B 8	3560 C 8	3596 B 8	3663 C 3	3733 E 1	3785 A 1	3863 E 8	4655 B 4	5501 C 7	6778 D 1	9512 D 7	9538 A 3	9562 C 6	9600 B 2	9783 C 1	9899 D 6
1713 C 2	2500 C 6	2543 A 8	2588 B 8	2715 E 2	2807 E 7	3517 B 8	3561 C 9	3600 B 4	3664 D 3	3735 D 4	3786 B 1	3866 E 7	4656 B 3	5631 C 2	6790 B 1	9513 E 4	9539 C 5	9563 C 5	9601 E 7	9784 A 3	

Component side view



1711	G 3	2632	C17	2638	D19	2644	A15	2692	D18	2704	C 4	2710	D 7	2716	E 6
1712	B 3	2633	G14	2639	L16	2645	K15	2693	D17	2705	E 4	2711	F 8	2717	I 9
1713	G20	2634	E14	2640	B16	2646	A14	2694	L14	2706	D 4	2712	D 8	2718	B 9
1720	F 1	2635	G16	2641	K17	2647	L14	2701	G 4	2707	E 5	2713	F 9	2719	I 8
1730	D 1	2636	E16	2642	A16	2648	B13	2702	C 4	2708	D 5	2714	D 9	2720	B 8
2631	H17	2637	H19	2643	K15	2691	D18	2703	F 4	2709	F 7	2715	G 6	2721	J 6

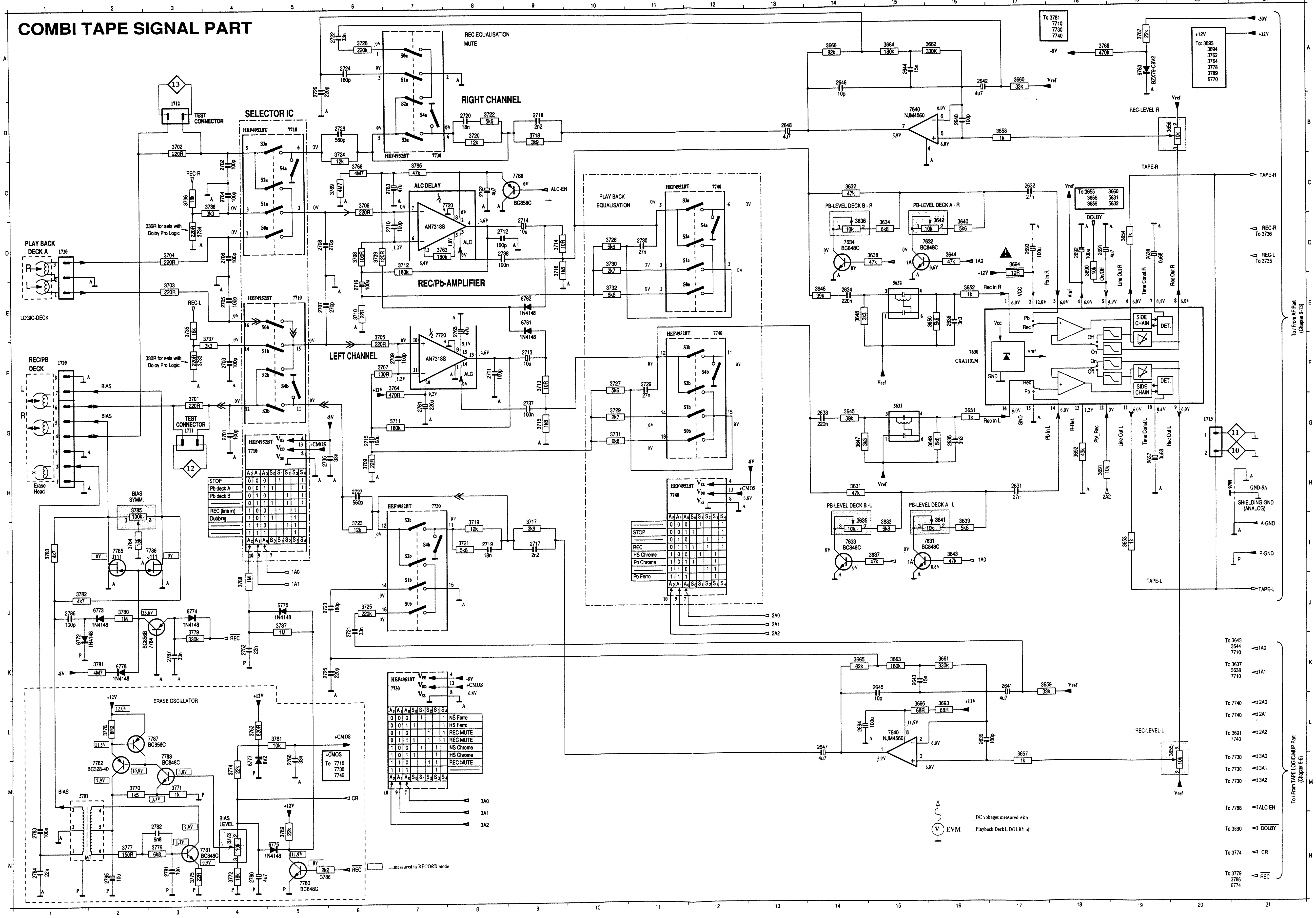
2722	A 6	2728	B 6	2752	K 4	2780	N 4	2786	J 1	3635	I14	3641	I16	3647	G14
2723	J 5	2729	F11	2760	M 5	2781	N 3	2787	K 3	3636	D14	3642	D16	3648	E14
2724	A 6	2730	D11	2761	G 7	2782	N 3	3631	H14	3637	I15	3643	I16	3649	G16
2725	K 5	2735	H 5	2762	C 8	2783	N 1	3632	C14	3638	D15	3644	D16	3650	E16
2726	A 5	2737	G 9	2763	C 6	2784	N 1	3633	I15	3639	I16	3645	G14	3651	G16
2727	H 6	2738	D 8	2765	E 8	2785	N 2	3634	D15	3640	D16	3646	E14	3652	E16

3653	I19	3659	K17	3665	K14	3694	D17	3705	E 6	3711	G 7	3717	I 9	3723	I 6
3654	D19	3660	A17	3666	A14	3695	L15	3706	C 6	3712	D 7	3718	B 9	3724	B 6
3655	L19	3661	K16	3690	D18	3701	F 3	3707	F 6	3713	F 9	3719	I 8	3725	J 6
3656	B19	3662	A16	3691	H18	3702	B 3	3708	D 6	3714	D 9	3720	B 8	3726	A 6
3657	M17	3663	K15	3692	G18	3703	E 3	3709	H 6	3715	G 9	3721	I 8	3727	F10
3658	B17	3664	A15	3693	L16	3704	D 3	3710	E 6	3716	D 9	3722	B 8	3728	D10

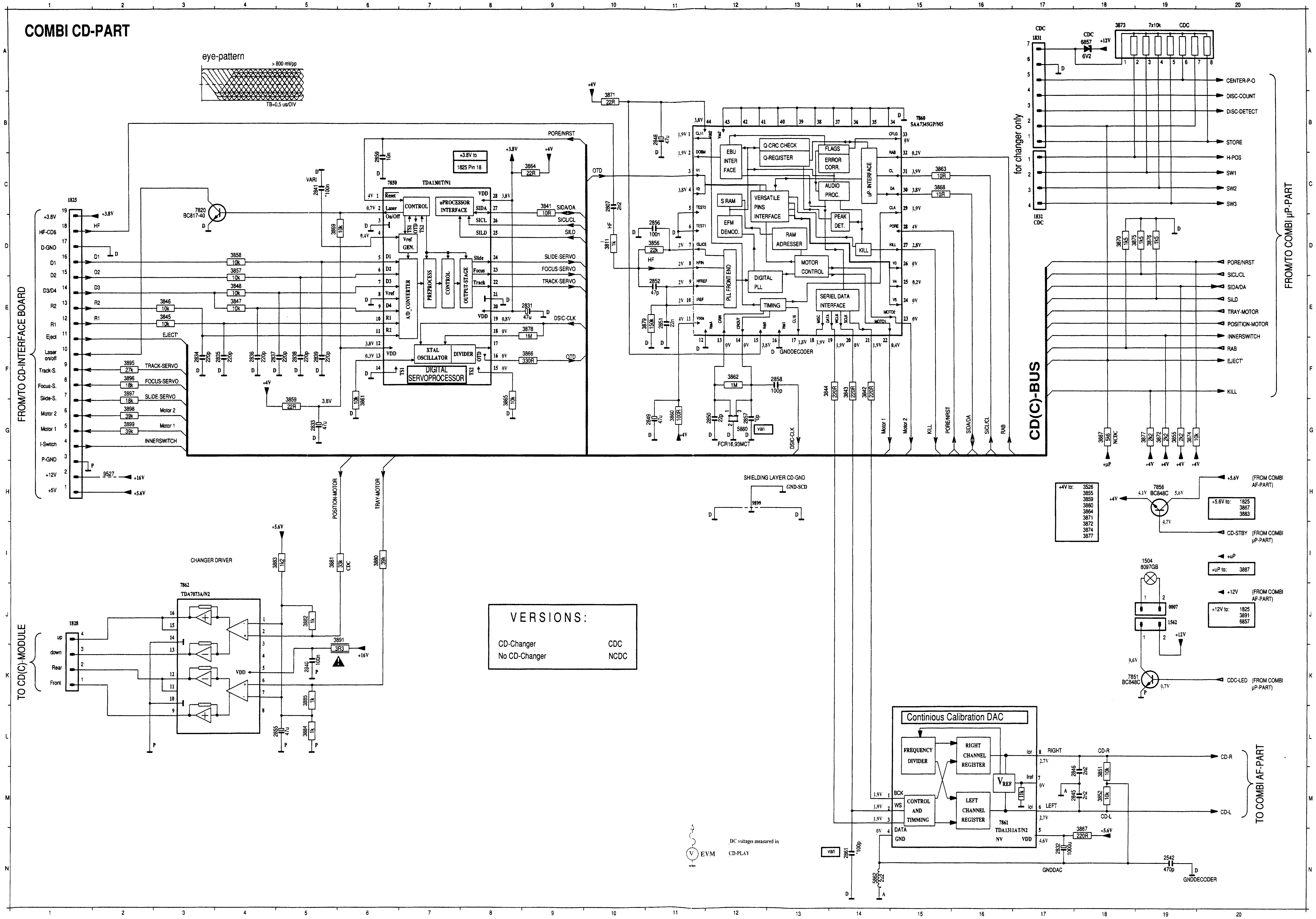
3729	G10	3735	E 3	3762	L 4	3768	A18	3774	N 4	3780	J 2	3786	N 5	5701	M 1
3730	D10	3736	C 3	3763	D 7	3769	C 6	3775	M 3	3781	K 2	3787	J 5	6760	A19
3731	G10	3737	E 4	3764	F 7	3770	M 2	3776	N 3	3782	J 1	3788	J 4	6761	E 9
3732	E10	3738	C 4	3765	C 7	3771	M 3	3777	N 2	3783	I 1	3789	N 5	6762	E 9
3733	F 3	3739	D 6	3766	C 6	3772	N 4	3778	L 2	3784	I 2	5631	G15	6772	J 1
3734	D 3	3761	L 5	3767	A19	3773	N 4	3779	J 3	3785	H 2	5632	E15	6773	J 2

6774	J 3	7631	I16	7710	B 5	7730	H 7	7781	N 4	7787	L 2
6775	J 5	7632	D16	7710	E 5	7730	K 7	7782	L 2	7788	C 9
6776	N 5	7633	I14	7710	G 4	7740	C12	7783	L 3		
6777	M 4	7634	D14	7720	C 7	7740	E12	7784	K 3		
6778	K 2	7640	L15	7720	E 7	7740	H11	7785	I 2		
7630	F16	7640	B15	7730	B 7	7780	N 5	7786	I 2		

COMBI TAPE SIGNAL PART



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
A B C D E F G H I J K L M N
SELECTOR IC
HEF4952BT 7710
HEF4952BT 7730
HEF4952BT 7740
REC.EQUALISATION
MUTE
RIGHT CHANNEL
LEFT CHANNEL
ALC DELAY
AN7318S
REC/Pb-AMPLIFIER
PLAY BACK EQUALISATION
PLAY BACK DECK A
LOGIC-DECK
REC/PB DECK
Erase Head
TEST CONNECTOR
BIAS
BIAS SYMM.
330R for sets with Dolby Pro Logic
REC-R
REC-L
ALC-EN
BC858C
J111
BC858B
1N4148
BZX79-C8V2
NJM4560
CXA1101M
PB-LEVEL DECK B - R
PB-LEVEL DECK A - R
PB-LEVEL DECK B -L
PB-LEVEL DECK A - L
BC848C
REC-LEVEL-R
REC-LEVEL-L
TAPE-R
TAPE-L
DOLBY
SIDE CHAIN
DET.
Rec In R
Rec In L
Vref
ERASE OSCILLATOR
BC328-40
BC858C
BIAS LEVEL
+CMOS To 7710 7730 7740
STOP
Pb deck A
Pb deck B
REC (line in)
Dubbing
REC
HS Chrome
Pb Chrome
Pb Ferro
NS Ferro
HS Ferro
REC MUTE
NS Chrome
HS Chrome
To 3781 7710 7730 7740
+12V To: 3693 3694 3762 3764 3778 3789 6770
-30V
+12V
-8V
GND-SA
SHIELDING-GND (ANALOG)
A-GND
P-GND
To / From AF Part (Chapter 9-13)
To / From TAPE LOGIC/MUP Part (Chapter 9-8)
To 3643 3644 7710 1A0
To 3637 3638 7710 1A1
To 7740 2A0
To 7740 2A1
To 3691 7740 2A2
To 7730 3A0
To 7730 3A1
To 7730 3A2
To 7788 ALC-EN
To 3690 DOLBY
To 3774 CR
To 3779 3786 6774 REC
DC voltages measured with Playback Deck1, DOLBY off
EVM
....measured in RECORD mode


COMBI CD-PART
eye-pattern
> 800 mVpp
TB=0,5 us/DIV
FROM/TO CD-INTERFACE BOARD
1825
+3.8V
HF-CD6
D-GND
D1
D2
D3/D4
R2
R1
Eject
Laser on/off
Track-S.
Focus-S.
Slide-S.
Motor 2
Motor 1
I-Switch
P-GND
+12V
+5V
7820 BC817-40
7850 TDA1301T/N1
DIGITAL SERVOPROCESSOR
CONTROL
uPROCESSOR INTERFACE
A/D CONVERTER
PREPROCESS
OUTPUT-STAGE
XTAL OSCILLATOR
DIVIDER
+3.8V to 1825 Pin 18
PORE/NRST
SLIDE-SERVO
FOCUS-SERVO
TRACK-SERVO
DSIC-CLK
SIDA/DA
SICL/CL
SILD
OTD
TRACK-SERVO
FOCUS-SERVO
SLIDE-SERVO
Motor 2
Motor 1
INNERSWITCH
EJECT
POSITION-MOTOR
TRAY-MOTOR
7860 SAA7345GP/M5
EBU INTERFACE
Q-CRC CHECK
Q-REGISTER
FLAGS
ERROR CORR.
AUDIO PROC.
µP INTERFACE
S RAM
VERSATILE PINS INTERFACE
EFM DEMOD.
RAM ADRESSER
PEAK DET.
KILL
MOTOR CONTROL
PLL FRONT END
DIGITAL PLL
TIMING
SERIEL DATA INTERFACE
GNDDECODER
FCR16,93MCT
CD(C)-BUS
for changer only
1831 CDC
1832 CDC
3873 7x10k CDC
6857 6V2
CENTER-P-O
DISC-COUNT
DISC-DETECT
STORE
H-POS
SW1
SW2
SW3
PORE/NRST
SICL/CL
SIDA/DA
SILD
TRAY-MOTOR
POSITION-MOTOR
INNERSWITCH
RAB
EJECT
KILL
FROM/TO COMBI µP-PART
SHIELDING LAYER CD-GND
GND-SCD
9899
CHANGER DRIVER
7862 TDA7073A/N2
1828
up
down
Rear
Front
TO CD(C)-MODULE
VERSIONS:
CD-Changer CDC
No CD-Changer NCDC
+4V to: 3526 3855 3859 3860 3864 3871 3872 3874 3877
7856 BC848C
+5.6V (FROM COMBI AF-PART)
+5.6V to: 1825 3867 3883
CD-STBY (FROM COMBI µP-PART)
1504 8097GB
+uP to: 3887
+12V (FROM COMBI AF-PART)
+12V to: 1825 3891 6857
0007
1562
7851 BC848C
CDC-LED (FROM COMBI µP-PART)
Continious Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMMING
VREF
7861 TDA1311AT/N2
RIGHT
LEFT
CD-R
CD-L
TO COMBI AF-PART
GNDDAC
GNDDECODER
DC voltages measured in CD-PLAY
EVM

0007	J19
1504	I19
1562	J19
1825	C 1
1826	H 1
1828	J 1
1831	A17
1832	D17
2542	N19
2807	C10
2831	E 9
2832	N17
2833	G 5
2834	F 3
2835	F 4
2836	F 4
2837	F 4
2838	F 5
2839	F 5
2840	K 5
2841	C 5
2845	M18
2846	M18
2848	B11
2849	G11
2850	G12
2851	E11
2852	E11
2855	L 5
2856	D11
2857	G12
2858	F13
2859	C 6
2861	N14
3811	D10
3841	C 9
3842	F14
3843	F14
3844	F13
3845	E 3
3846	E 3
3847	E 4
3848	E 4
3851	M18
3852	M18
3855	G19
3856	D11
3857	D 4
3858	D 4
3859	G 5
3860	G11
3861	G 6
3862	F12
3863	C15
3864	C 9
3865	G 8
3866	F 9
3867	N18
3868	C15
3869	D 5
3870	D18
3871	B10
3872	G19
3873	A18
3874	G19
3875	D18
3876	D19
3877	G19
3878	E 9
3879	E10
3880	I 6
3881	I 5
3882	J 5
3883	I 4
3884	L 5
3885	K 5
3887	G18
3891	J 6
3895	F 2
3896	F 2
3897	F 2
3898	G 2
3899	G 2
4899	F18
5860	G12
5862	N14
6857	A18
7820	C 3
7850	C 6
7851	K19
7856	H19
7860	B15
7861	M16
7862	J 3
9527	H 2
9607	F18
9899	H12

2501	E 2
2502	D 4
2513	E 4
2514	D 3
2515	D 2
2516	C 2
2523	E 2
2524	E 2
2525	E 1
2526	E 2
2527	E 2
2528	D 2
2531	E 2
2532	E 2
2533	D 2
2534	C 2
2535	E 3
2536	E 3
2538	D 4
2539	E 5
2540	D 4
2553	D 4
2559	E 3
2573	C 2
2574	C 2
2581	D 2
2582	C 2
2583	D 2
2584	C 2
2585	D 2
2586	D 2
2590	E 6
2591	D 5
2631	C 9
2632	B 9
2633	C 8
2634	B 8
2635	C 8
2636	B 8
2639	C 7
2640	B 7
2643	C 7
2644	B 7
2645	C 7
2646	B 7
2705	A 8
2706	A 8
2707	A 8
2708	A 8
2709	A 8
2710	A 8
2719	C 8
2720	B 8
2721	B 8
2723	B 7
2724	B 8
2725	B 7
2726	B 7
2728	B 8
2729	A 7
2730	A 7
2731	A 7
2732	A 7
2737	A 8
2738	A 8
2752	E 9
2760	A 9
2782	E 9
2787	E 9
2794	C 5
2834	A 4
2835	A 4
2836	A 4
2837	A 4
2838	A 4
2839	A 3
2840	A 5
2841	A 3
2847	A 3
2850	A 3
2851	A 3
2852	A 3
2856	A 2
2860	B 3
2861	B 2
2862	A 3
3500	C 3
3501	E 2
3502	D 4
3504	D 3
3506	E 3
3508	D 4
3510	D 2
3512	D 3
3513	D 2
3514	C 2
3515	D 2
3522	C 2
3523	D 2
3524	D 2
3528	D 3
3529	D 2
3530	C 2
3532	D 3
3533	E 4
3534	E 4
3537	D 4
3538	D 4
3539	D 4
3540	D 4
3542	C 4
3545	C 4
3546	C 4
3547	E 2
3548	E 2
3549	D 4
3550	C 3
3552	E 2
3554	E 2
3555	E 1
3556	E 2
3567	E 2
3568	D 1
3572	E 5
3573	E 1
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3648	B 9
3649	C 8
3650	B 9
3651	C 9
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3712	A 8
3713	B 8
3714	A 7
3716	A 8
3719	B 8
3720	B 8
3721	C 8
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3725	B 8
3726	B 7
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3729	A 7
3730	A 7
3731	A 7
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3734	A 8
3737	A 9
3739	A 7
3743	D 7
3744	D 7
3745	D 7
3746	D 7
3747	D 8
3748	D 8
3749	D 7
3750	D 7
3751	E 7
3752	E 7
3756	D 7
3758	E 7
3760	E 6
3762	A 5
3763	A 8
3764	A 7
3766	A 7
3767	A 6
3769	A 7
3771	E 9
3772	E 8
3774	E 5
3778	E 9
3779	E 9
3780	E 9
3781	B 9
3782	E 9
3783	E 9
3784	E 9
3787	E 9
3790	D 7
3795	E 5
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3842	B 2
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3844	B 3
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3874	B 3
3876	C 4
3877	B 3
3878	B 4
3879	A 3
3880	A 5
3881	A 5
3882	A 5
3883	A 5
3884	A 4
3885	A 5
4500	C 1
4501	B 3
4502	C 5
4503	A 9
4506	C 8
4510	B 1
4511	E 8
4516	A 7
4517	C 8
4518	D 8
4520	E 4
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4527	E 4
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4548	C 2
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4640	C 6
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4650	C 7
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4652	D 6
4653	D 6
4658	D 6
4659	D 6
4660	D 6
4661	D 6
4662	D 5
4663	D 5
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4713	B 5
4716	C 6
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4803	A 3
4804	C 3
4805	C 3
4899	C 4
6551	E 4
6552	D 4
6553	E 4
6554	D 4
7500	C 4
7501	D 2
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7504	C 2
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7508	C 1
7509	C 1
7512	C 4
7513	E 1
7514	E 2
7515	E 2
7516	E 1
7553	E 3
7630	C 9
7631	C 9
7632	B 9
7633	C 9
7634	B 9
7640	C 7
7650	D 9
7651	D 9
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7653	D 9
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7659	E 7
7660	E 8
7661	D 8
7662	D 8
7690	D 6
7701	C 5
7710	A 9
7720	A 8
7730	B 8
7740	A 7
7780	E 9
7781	E 9
7783	E 8
7784	E 9
7787	E 9
7788	A 6
7820	A 4
7850	B 4
7851	E 6
7852	B 2
7853	B 2
7856	B 3
7860	A 2
7861	B 2
T001	A 4
T002	A 3
T003	A 3
T004	A 4
T005	A 3
T006	A 4
T007	A 4
T008	A 4
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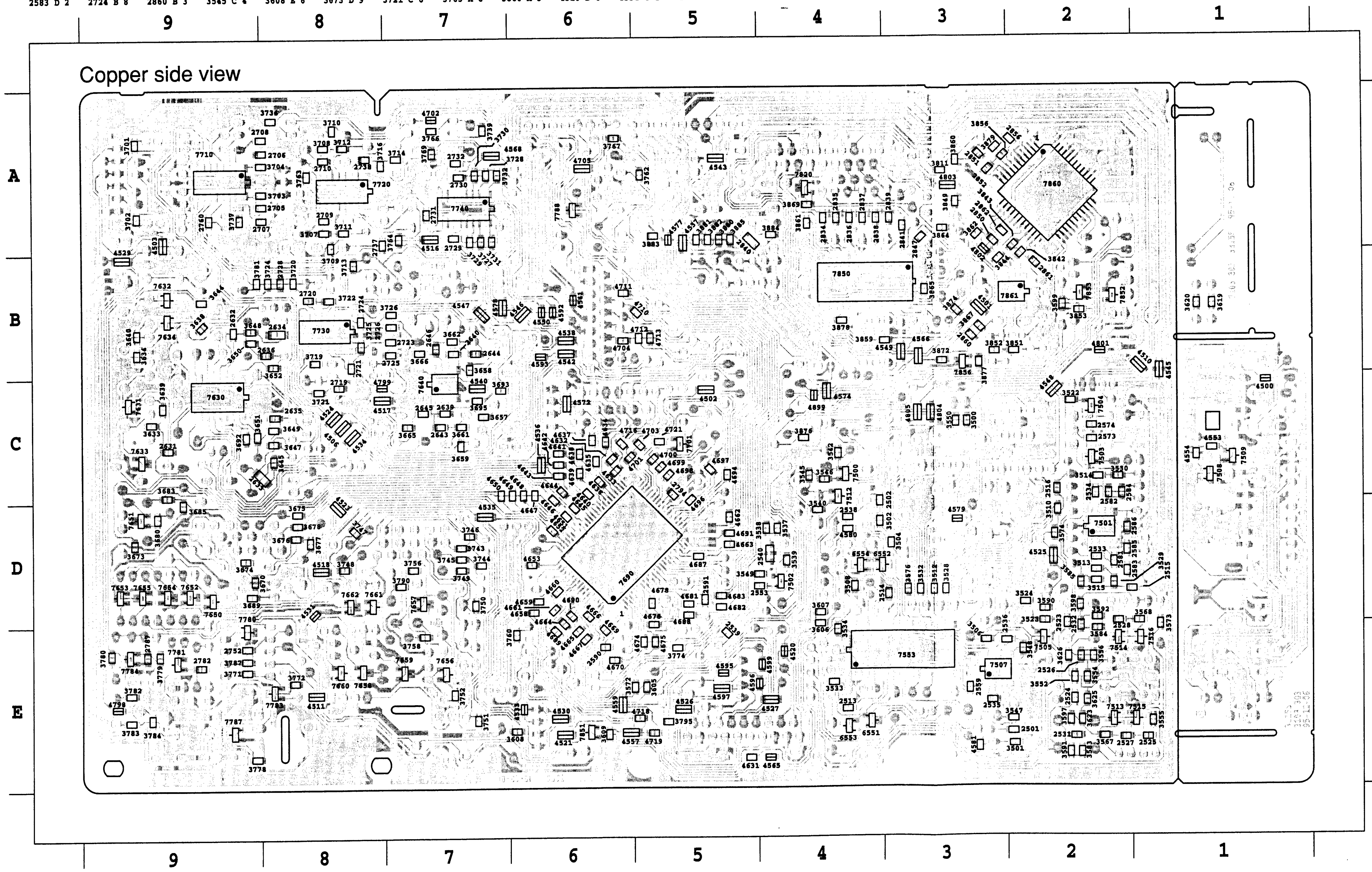

Copper side view

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0004	A 9
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1552	C 8
1553	C 7
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1556	B 9
1557	C 8
1558	B 9
1559	C 8
1560	B 9
1561	C 7
1562	A 4
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1712	E 1
1713	C 2
1720	E 1
1730	E 2
1740	A 4
1741	B 1
1742	B 3
1743	B 3
1750	D 4
1820	D 8
1824	D 8
1825	E 6
1826	E 6
1828	D 5
1829	E 4
1830	A 5
1831	C 4
1832	C 4
1833	E 5
1834	A 5
1835	A 5
2500	C 6
2503	A 7
2504	B 7
2505	A 7
2506	B 6
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2530	B 8
2537	A 8
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2555	C 7
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2557	B 8
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2563	B 9
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2588	B 8
2589	D 8
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2638	D 1
2641	C 3
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2647	C 3
2648	D 3
2691	D 1
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2693	C 1
2694	C 3
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2702	E 1
2703	E 1
2704	E 1
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2712	E 2
2713	E 2
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2717	D 2
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2722	D 3
2727	D 2
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2734	A 5
2735	E 1
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2762	E 3
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2833	D 6
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2843	B 7
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2845	C 7
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2858	D 7
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3507	A 6
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3517	B 8
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3521	C 8
3525	D 8
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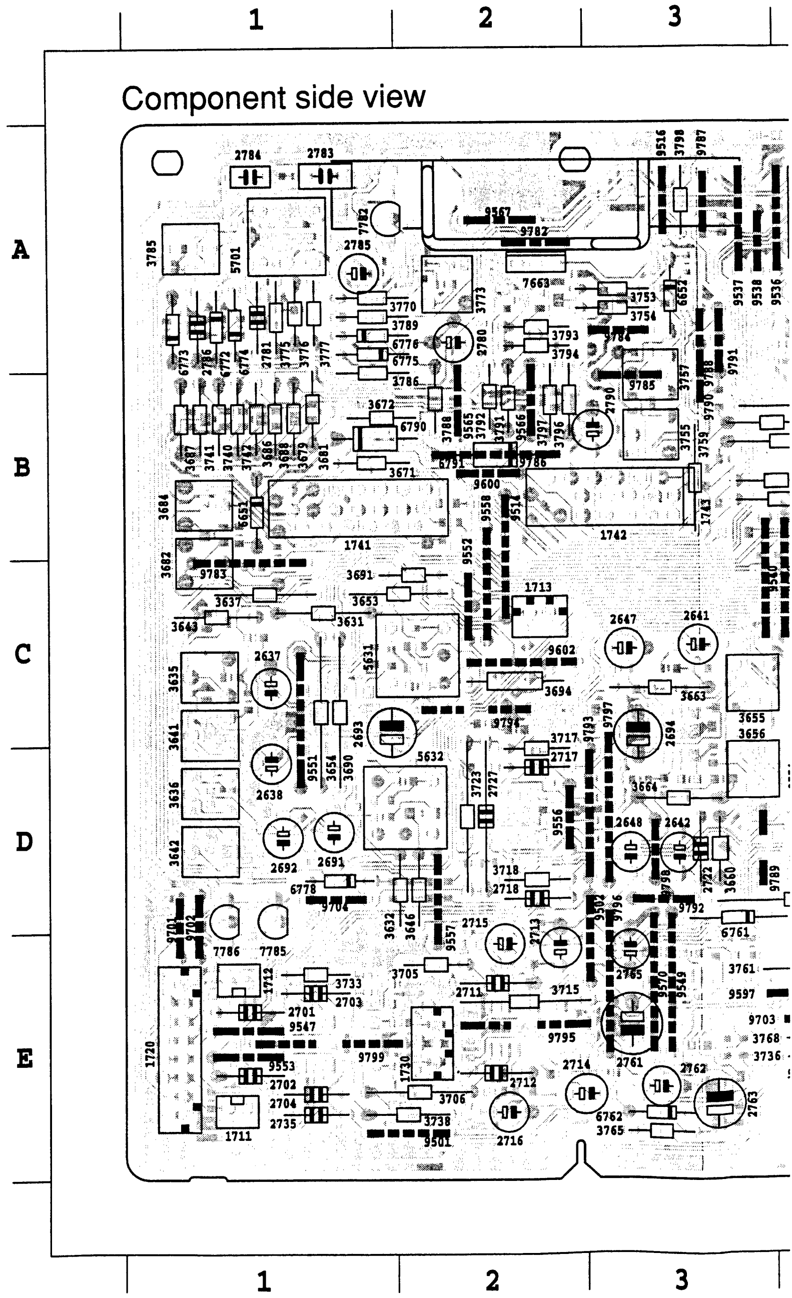

Component side view

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4899 C 4
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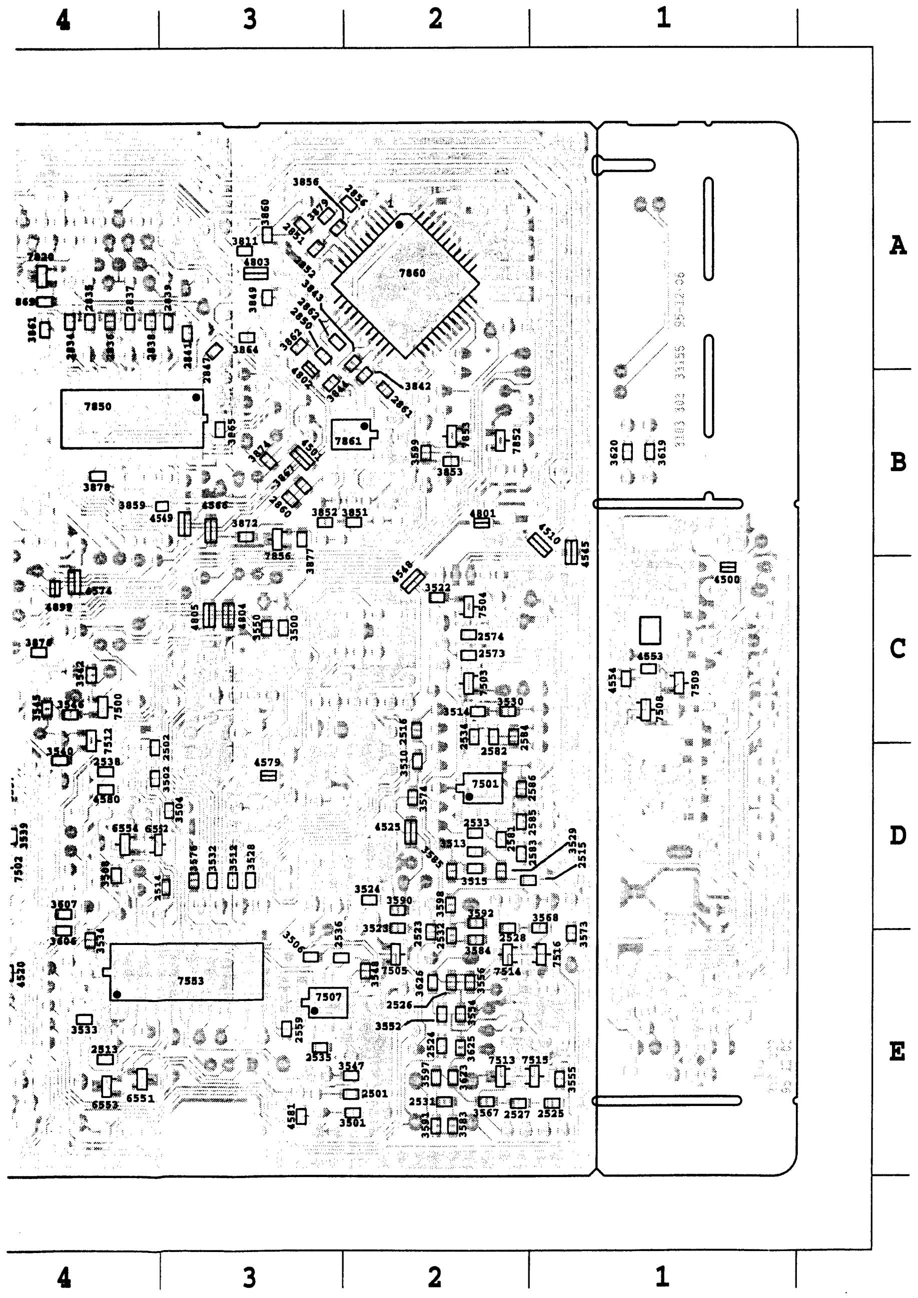

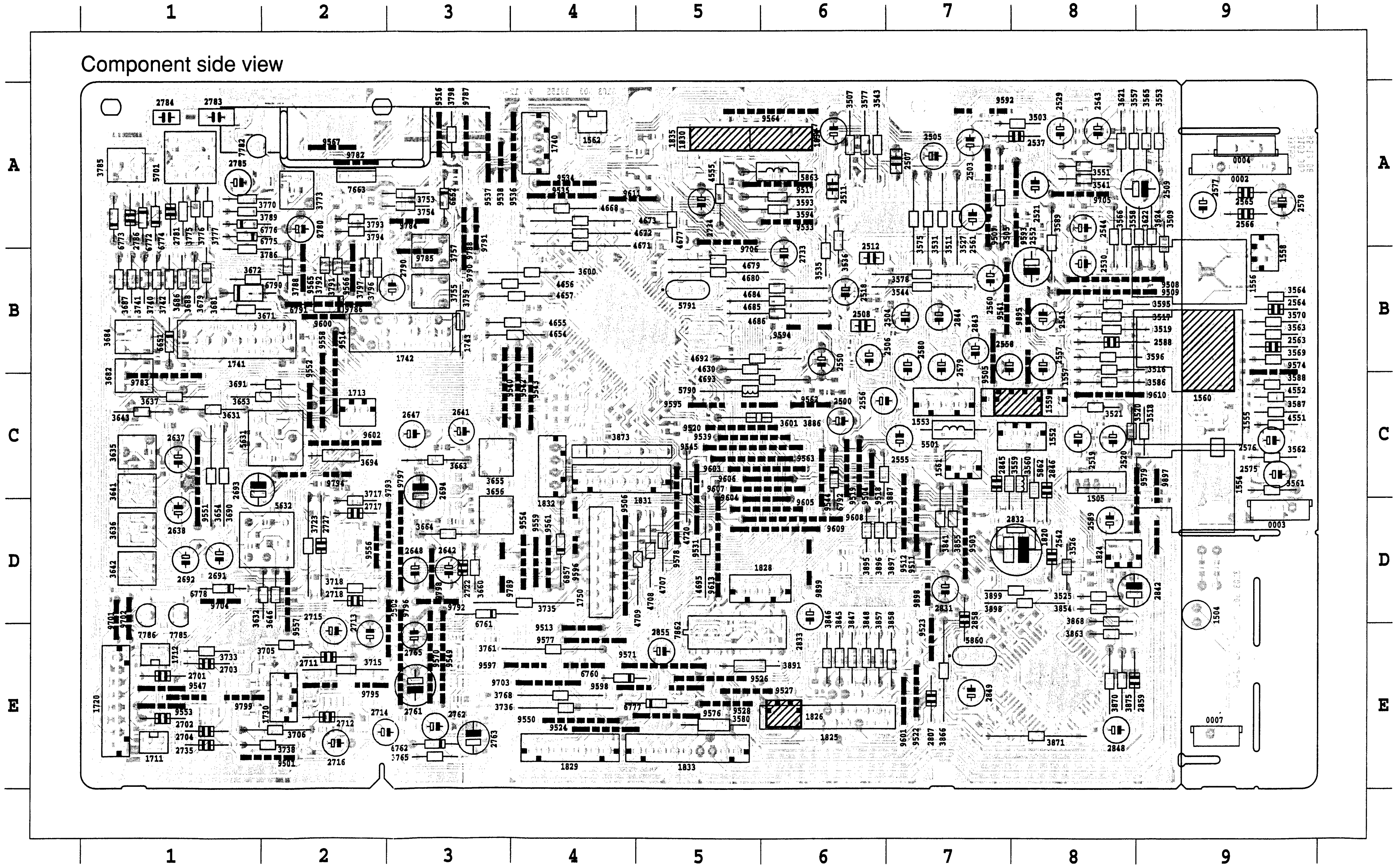

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2573 C 2	2719 C 8	2850 A 3	3538 D 4	3599 B 2	3662 B 7	3714 A 7	3756 D 7	3852 B 3	4510 B 1	4548 C 2	4636 C 6	4669 E 6	4713 B 5	7514 E 2	7740 A 7	T014 B 3	T047 A 6	T078 A 5	T118 D 9	T149 E 7	
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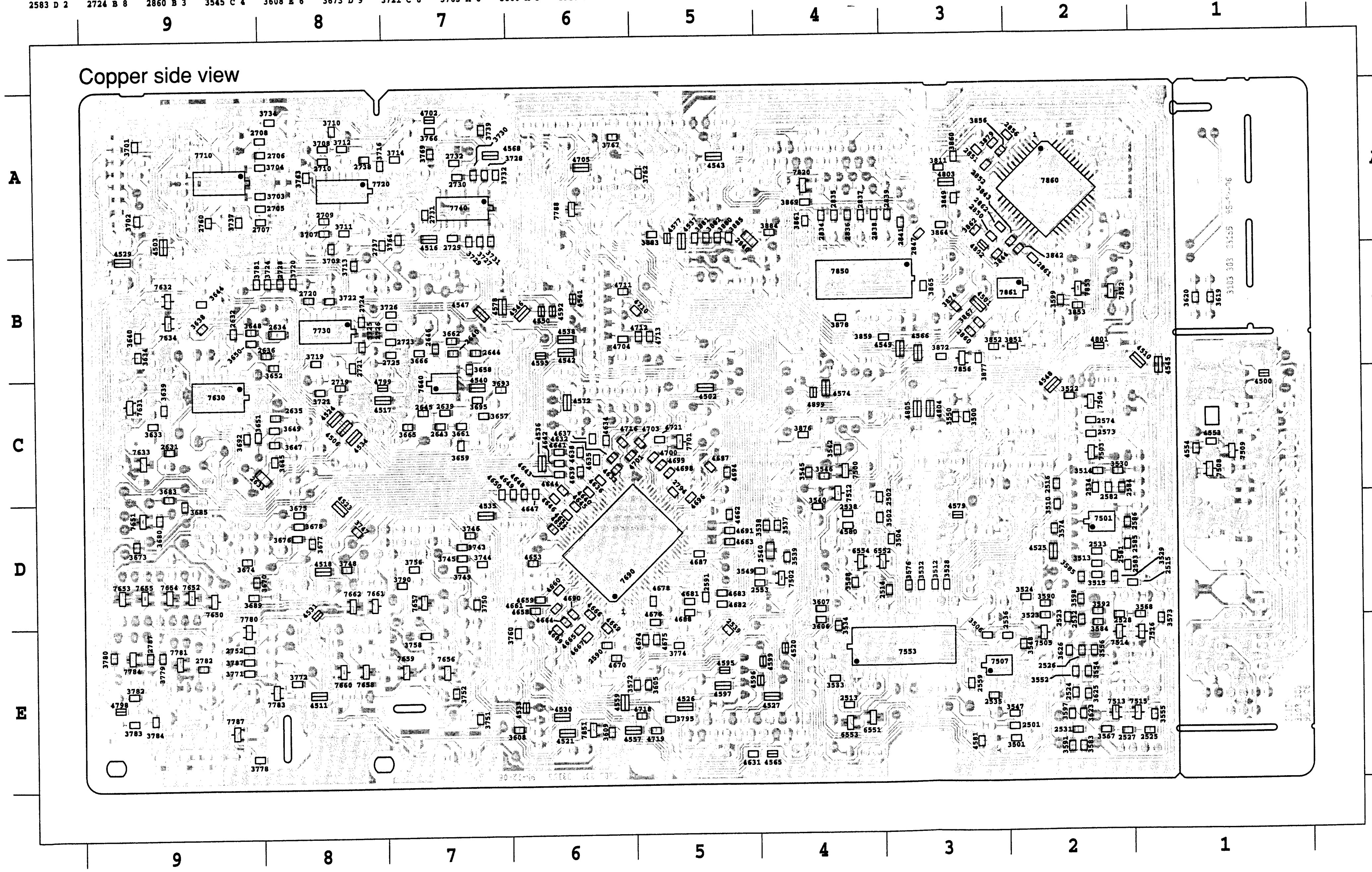
Copper side view



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0007 E 9	1741 B 1	2506 B 6	2555 C 7	2641 C 3	2722 D 3	2842 D 8	3521 C 8	3565 A 9	3624 A
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1505 C 8	1743 B 3	2508 B 6	2557 B 8	2647 C 3	2733 B 6	2844 B 7	3526 D 8	3569 B 9	3632 D
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1555 C 9	1825 E 6	2517 A 6	2563 B 9	2693 C 1	2762 E 3	2849 E 7	3536 A 6	3578 B 7	3641 C
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1558 B 9	1829 E 4	2520 C 8	2566 A 9	2702 E 1	2780 A 2	2859 E 8	3544 B 7	3587 C 9	3646 D
1559 C 8	1830 A 5	2521 A 8	2575 C 9	2703 E 1	2781 A 1	3503 A 8	3551 A 8	3588 C 9	3653 C
1560 B 9	1831 C 4	2529 A 8	2576 C 9	2704 E 1	2783 A 1	3505 A 7	3553 A 9	3589 A 8	3654 C
1561 C 7	1832 C 4	2530 B 8	2577 A 9	2711 E 2	2784 A 1	3507 A 6	3557 A 8	3593 A 6	3655 C
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1712 E 1	1835 A 5	2542 D 8	2580 B 7	2714 E 2	2790 B 3	3516 B 8	3560 C 8	3596 B 8	3663 C
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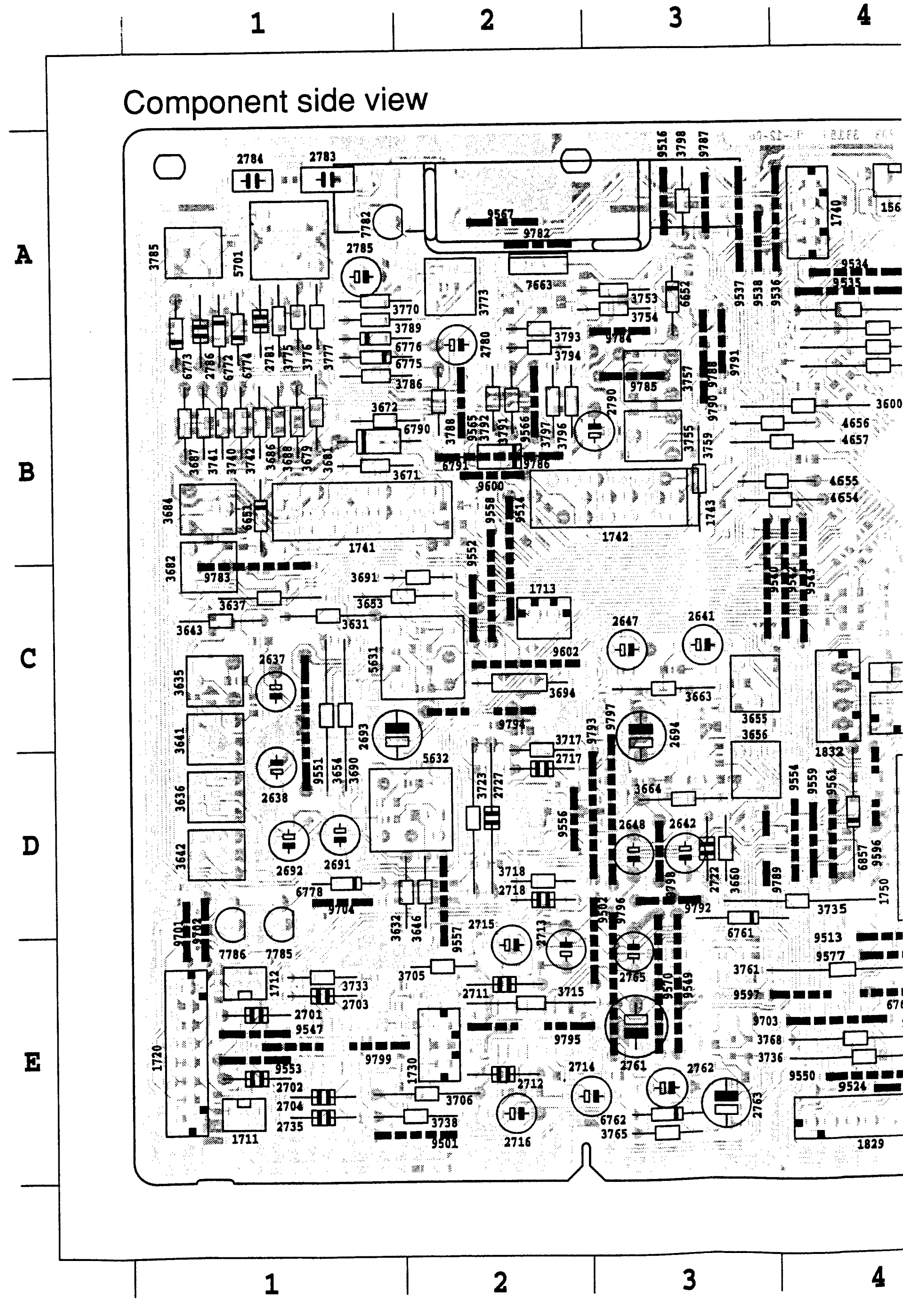
Component side view



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4801 B 2	7633 C 9	7820 A 4	T025 B 5	T054 A 6	T085 E 6	T125 D 7	T167 A 8
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7503 C 2	7660 E 8	T006 A 4	T038 C 6	T068 E 5	T098 D 1	T141 B 6	
7504 C 2	7661 D 8	T007 A 4	T039 C 6	T069 B 1	T099 E 1	T142 A 5	
7505 E 2	7662 D 8	T008 A 4	T040 C 6	T070 B 1	T100 E 6	T143 B 6	
7507 E 3	7690 D 6	T009 A 3	T041 C 6	T071 B 1	T113 D 8	T144 A 6	
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7509 C 1	7710 A 9	T011 A 4	T043 A 2	T073 B 2	T115 D 8	T146 B 6	
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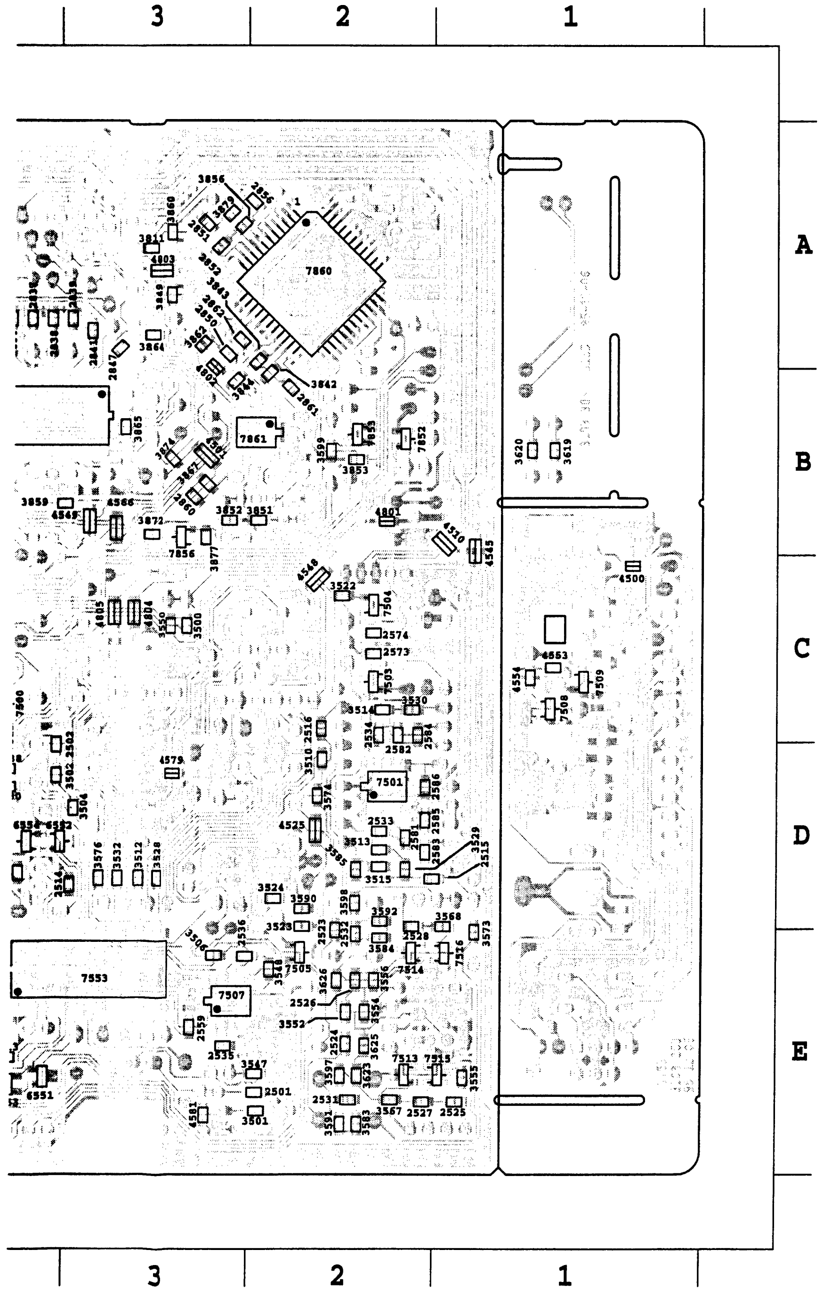

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0003 D 9	1730 E 2	2504 B 7	2550 B 6	2637 C 1	2717 D 2	2832 D 8	3519 B 8	3563 B 9	3621 A 8	3672 B 1	3738 E 2	3789 A 1	3870 E 8	4668 A 4	5701 A 1	6792 C 6	9516 A 3	9541 B 7	9565 B 2	9603 C 6	9786 B 2
0004 A 9	1740 A 4	2505 A 7	2552 B 8	2638 D 1	2718 D 2	2833 D 6	3520 C 8	3564 B 9	3622 A 9	3679 B 1	3740 B 1	3791 B 2	3871 E 8	4671 A 4	5790 C 5	6857 D 4	9517 A 6	9542 C 4	9566 B 2	9604 D 6	9787 A 3
0007 E 9	1741 B 1	2506 B 6	2555 C 7	2641 C 3	2722 D 3	2842 D 8	3521 C 8	3565 A 9	3624 A 9	3681 B 1	3741 B 1	3792 B 2	3873 C 4	4672 A 4	5791 B 5	7663 A 2	9518 C 6	9543 C 4	9567 A 2	9605 D 6	9788 A 3
1504 D 9	1742 B 3	2507 A 7	2556 C 6	2642 D 3	2727 D 2	2843 B 7	3525 D 8	3566 A 8	3631 C 1	3682 C 1	3742 B 1	3793 A 2	3875 E 8	4673 A 4	5860 E 7	7782 A 1	9519 C 6	9544 C 6	9570 E 3	9606 C 6	9789 D 3
1505 C 8	1743 B 3	2508 B 6	2557 B 8	2647 C 3	2733 B 6	2844 B 7	3526 D 8	3569 B 9	3632 D 2	3684 B 1	3753 A 3	3794 A 2	3886 C 6	4677 A 5	5862 C 8	7785 D 1	9520 C 5	9545 C 5	9571 E 5	9607 C 6	9790 A 3
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1554 C 9	1824 D 8	2512 B 6	2561 A 7	2692 D 1	2761 E 3	2848 E 8	3535 B 6	3577 A 6	3637 C 1	3688 B 1	3757 B 3	3798 A 3	3895 D 6	4684 B 6	6652 A 3	9501 E 2	9524 E 4	9550 E 4	9577 E 4	9610 C 8	9793 D 3
1555 C 9	1825 E 6	2517 A 6	2563 B 9	2693 C 1	2762 E 3	2849 E 7	3536 A 6	3578 B 7	3641 C 1	3690 C 1	3759 B 3	3841 D 7	3896 D 6	4685 B 6	6760 E 4	9502 E 3	9526 E 5	9551 C 1	9578 D 5	9611 A 4	9794 C 2
1556 B 9	1826 E 6	2518 B 6	2564 B 9	2694 C 3	2763 E 3	2855 E 5	3541 A 8	3580 E 5	3642 D 1	3691 C 2	3761 E 4	3845 E 6	3897 D 7	4686 B 6	6761 D 3	9503 D 7	9527 E 5	9552 C 2	9579 D 9	9613 D 5	9795 E 2
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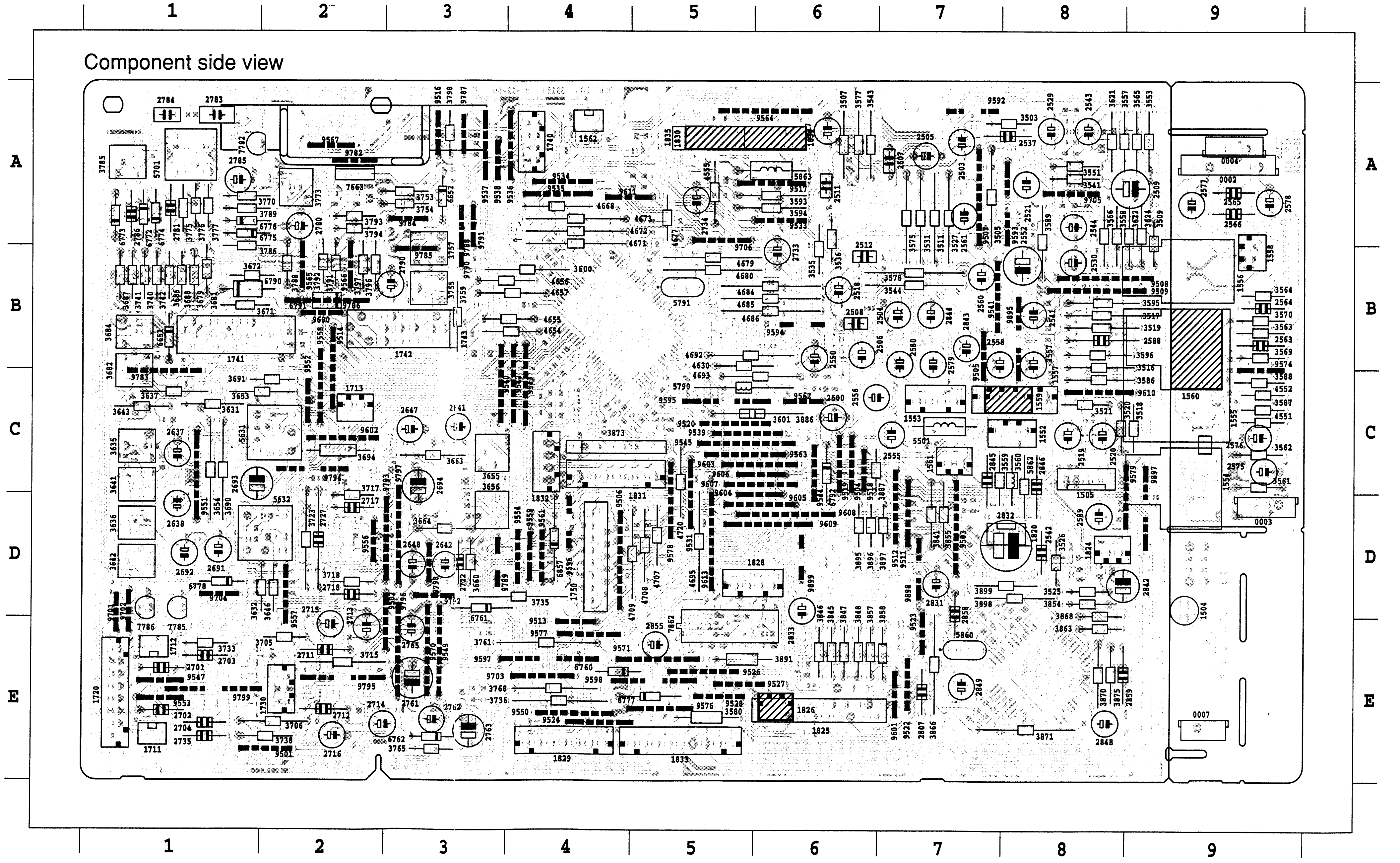
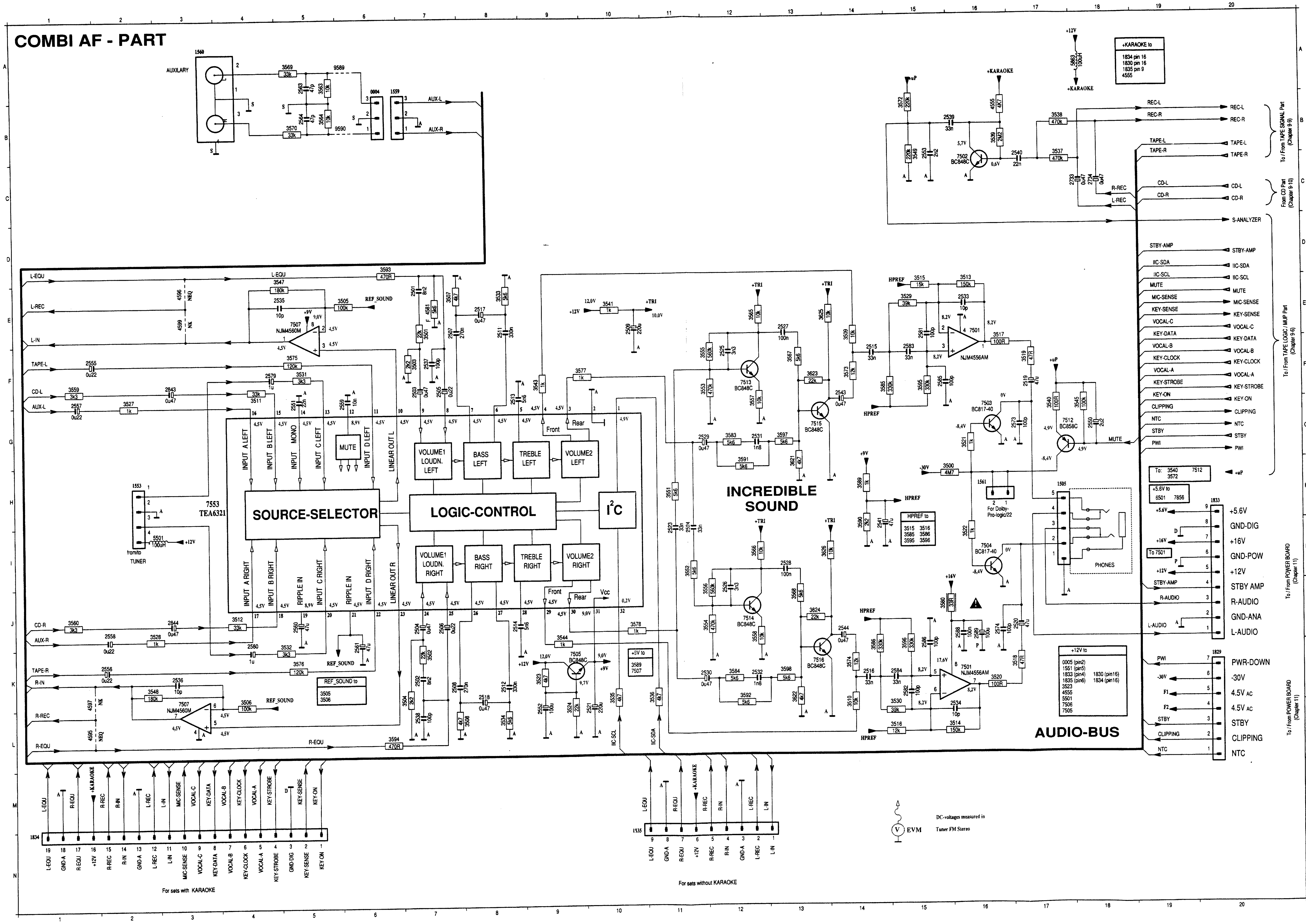
1712 E 1	1835 A 5	2542 D 8	2580 B 7	2714 E 2	2790 B 3	3516 B 8	3560 C 8	3596 B 8	3663 C 3	3733 E 1	3785 A 1	3863 E 8	4655 B 4	5501 C 7	6778 D 1	9512 D 7	9538 A 3	9562 C 6	9600 B 2	9783 C 1	9899 D 6
1713 C 2	2500 C 6	2543 A 8	2588 B 8	2715 E 2	2807 E 7	3517 B 8	3561 C 9	3600 B 4	3664 D 3	3735 D 4	3786 B 1	3866 E 7	4656 B 3	5631 C 2	6790 B 1	9513 E 4	9539 C 5	9563 C 5	9601 E 7	9784 A 3	


Component side view


COMBI AF - PART
AUXILARY
1560
AUX-L
AUX-R
SOURCE-SELECTOR
LOGIC-CONTROL
I²C
7553
TEA6321
INPUT A LEFT
INPUT B LEFT
INPUT MONO
INPUT C LEFT
MUTE
INPUT D LEFT
LINEAR OUT L
INPUT A RIGHT
INPUT B RIGHT
RIPPLE IN
INPUT C RIGHT
RIPPLE IN
INPUT D RIGHT
LINEAR OUT R
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
Front
Rear
Vcc
REF_SOUND
REF_SOUND to
NJM4560M
INCREDIBLE SOUND
BC848C
BC817-40
BC858C
NJM4556AM
HPREF
HPREF to
For Dolby-Pro-logic/22
PHONES
AUDIO-BUS
+KARAOKE to
+12V to
+3V to
+5.6V to
To 7501
from/to TUNER
REC-L
REC-R
TAPE-L
TAPE-R
To / From TAPE SIGNAL Part (Chapter 9-9)
CD-L
CD-R
From CD Part (Chapter 9-10)
S-ANALYZER
STBY-AMP
IIC-SDA
IIC-SCL
MUTE
MIC-SENSE
KEY-SENSE
VOCAL-C
KEY-DATA
VOCAL-B
KEY-CLOCK
VOCAL-A
KEY-STROBE
KEY-ON
CLIPPING
NTC
STBY
PWI
To / From TAPE LOGIC / MUP Part (Chapter 9-6)
+5.6V
GND-DIG
+16V
GND-POW
+12V
STBY AMP
R-AUDIO
GND-ANA
L-AUDIO
PWR-DOWN
-30V
4.5V AC
4.5V AC
STBY
CLIPPING
NTC
To / From POWER BOARD (Chapter 11)
1834
1835
For sets with KARAOKE
For sets without KARAOKE
DC-voltages measured in Tuner FM Stereo
EVM

0002	A 7
0003	G 2
0004	A 6
1505	H17
1552	G 2
1553	H 3
1554	J 1
1555	A 2
1556	B11
1557	A 8
1558	A10
1559	A 8
1560	A 3
1561	H16
1829	K20
1830	M 6
1833	H20
1834	N 1
1835	N10
2500	D11
2501	E 7
2502	K 7
2503	F 7
2504	J 7
2505	F 7
2506	J 7
2507	E 7
2508	K 7
2509	E10
2511	E 8
2512	K 8
2513	F 8
2514	J 8
2515	F14
2516	K14
2517	E 8
2518	K 8
2519	F17
2520	J17
2521	L10
2523	I11
2524	I11
2525	F12
2526	J12
2527	E13
2528	I13
2529	G11
2530	K11
2531	G12
2532	K12
2533	E16
2534	L16
2535	E 5
2536	K 3
2537	F 7
2538	L 7
2539	B16
2540	C17
2541	I14
2543	F14
2544	J14
2550	G18
2552	L 9
2553	B15
2555	F 1
2556	K 2
2557	F 1
2558	J 2
2559	F 6
2560	J 5
2561	J 6
2563	A 5
2564	B 5
2565	A 6
2566	B 6
2573	G17
2574	J16
2575	H 1
2576	H 1
2577	C 5
2578	D 5
2579	F 4
2580	J 4
2581	E15
2582	K15
2583	F15
2584	K15
2585	F15
2586	K15
2588	J16
2589	J16
2733	C18
2734	C18
2843	F 3
2844	J 3
3500	H15
3501	E 7
3502	K 7
3503	F 7
3504	K 7
3505	E 6
3506	K 4
3507	E 7
3508	L 8
3509	E14
3510	K14
3511	F 4
3512	J 4
3513	E16
3514	L16
3515	E15
3516	L15
3517	E16
3518	K17
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3521	G16
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3523	K 9
3524	L 9
3527	F 2
3528	J 2
3529	E15
3530	L15
3531	F 5
3532	J 5
3533	E 8
3534	L 8
3535	K10
3536	K11
3537	B17
3538	B17
3539	B16
3540	G17
3541	E10
3542	C11
3543	F 9
3544	J 9
3545	G18
3546	C11
3547	D 5
3548	K 2
3549	B15
3550	C11
3551	H11
3552	I11
3553	F11
3554	J11
3555	F11
3556	J11
3557	F12
3558	J12
3559	F 1
3560	J 1
3561	H 1
3562	H 1
3563	A 5
3564	B 5
3565	E12
3566	I12
3567	F13
3568	J13
3569	A 5
3570	B 5
3572	B15
3573	F14
3574	K14
3575	F 5
3576	K 5
3577	F 9
3578	J10
3580	J15
3583	G12
3584	K12
3585	F14
3586	K14
3587	C 5
3588	D 5
3589	H14
3590	I14
3591	G12
3592	K12
3593	D 6
3594	L 6
3595	F15
3596	K15
3597	G13
3598	K13
3621	G13
3622	K13
3623	F13
3624	J13
3625	E13
3626	I13
4551	C 4
4552	D 4
4553	C 4
4554	C 4
4555	B16
4580	L 7
4581	E 7
4595	L 1
4596	E 3
4597	K 1
4599	E 3
5501	I 3
5863	A18
6551	F 8
6552	J 8
6553	F 8
6554	K 8
7500	C10
7501	E16
7501	K16
7502	C16
7503	G16
7504	I16
7505	K 9
7507	E 5
7507	K 3
7508	C 3
7509	C 3
7512	G17
7513	F12
7514	J12
7515	G13
7516	K13
7553	F 5

ELECTRICAL PARTSLIST COMBI BOARD

MISCELLANEOUS

	4822 492 71734	SPRING CLIP TO126
1504	4822 134 41176	LAMP
1560	4822 265 20553	CHINCH SOCKET

CAPACITORS

2501	4822 122 33336	8,2NF10%X7R 50V
2502	4822 122 33336	8,2NF10%X7R 50V
2503	4822 124 41407	0,47UF 20% 63V
2504	4822 124 41407	0,47UF 20% 63V
2505	4822 124 40746	0,22UF20% 63V
2506	4822 124 40746	0,22UF20% 63V
2507	4822 121 41738	270NF 5% 63V
2508	4822 121 41738	270NF 5% 63V
2509	4822 124 22263	220UF20% 25V
2511	5322 121 42661	330NF 5% 63V
2512	5322 121 42661	330NF 5% 63V
2513	4822 122 32646	5,6NF10%X7R 50V
2514	4822 122 32646	5,6NF10%X7R 50V
2515	4822 122 33342	33NF10%X7R 63V
2516	4822 122 33342	33NF10%X7R 63V
2517	4822 124 41407	0,47UF 20% 63V
2518	4822 124 41407	0,47UF 20% 63V
2519	4822 124 40433	47UF20% 25V
2520	4822 124 40433	47UF20% 25V
2521	4822 124 40196	220UF20% 16V
2523	4822 122 33342	33NF10%X7R 63V
2524	4822 122 33342	33NF10%X7R 63V
2525	4822 122 33342	33NF10%X7R 63V
2526	4822 122 33342	33NF10%X7R 63V
2527	4822 126 13296	100NF10% X7R 16V
2528	4822 126 13296	100NF10% X7R 16V
2529	4822 124 41407	0,47UF 20% 63V
2530	4822 124 41407	0,47UF 20% 63V
2531	4822 122 33219	1,8NF10%X7R 50V
2532	4822 122 33219	1,8NF10%X7R 50V
2533	5322 122 32448	10PF 5% 50V
2534	5322 122 32448	10PF 5% 50V
2535	5322 122 32448	10PF 5% 50V
2536	5322 122 32448	10PF 5% 50V
2537	4822 122 33195	100PF 10% 50V
2538	5322 122 32531	100PF 5%NP0 50V
2539	4822 122 33342	33NF10%X7R 63V
2540	4822 122 31797	22NF10%X7R 63V
2541	4822 124 40433	47UF20% 25V
2542	4822 122 33519	470PF10% 50V
2543	4822 124 41407	0,47UF 20% 63V
2544	4822 124 41407	0,47UF 20% 63V
2550	4822 124 41576	1UF/50V
2552	4822 124 41525	100UF 20% 25V
2553	4822 122 33175	2,2NF 20% X7R 50V
2555	4822 124 40746	0,22UF20% 63V
2556	4822 124 40746	0,22UF20% 63V
2557	4822 124 40746	0,22UF20% 63V
2558	4822 124 40746	0,22UF20% 63V
2559	4822 122 33177	10NF 20% X7R 50V
2560	4822 124 40433	47UF20% 25V
2561	4822 124 40433	47UF20% 25V
2563	4822 122 33848	47PF 5%SL 50V
2564	4822 122 33848	47PF 5%SL 50V

CAPACITORS

2565	4822 126 13174	33NF+80-20% 16V
2566	4822 126 13174	33NF+80-20% 16V
2573	5322 122 32531	100PF 5%NP0 50V
2574	5322 122 32531	100PF 5%NP0 50V
2579	4822 124 40242	1UF20% 63V
2580	4822 124 40242	1UF20% 63V
2581	5322 122 32531	100PF 5%NP0 50V
2582	5322 122 32531	100PF 5%NP0 50V
2583	4822 122 33342	33NF10%X7R 63V
2584	4822 122 33342	33NF10%X7R 63V
2585	5322 122 32531	100PF 5%NP0 50V
2586	5322 122 32531	100PF 5%NP0 50V
2588	4822 126 12882	100NF+80-20% 50V
2589	4822 124 41525	100UF 20% 25V
2590	4822 122 33177	10NF 20% X7R 50V
2591	4822 122 33177	10NF 20% X7R 50V
2631	4822 122 32541	27NF10%X7R 63V
2632	4822 122 32541	27NF10%X7R 63V
2633	4822 126 13057	220NF10% X7R 25V
2634	4822 126 13057	220NF10% X7R 25V
2635	4822 122 33891	3,3NF10%X7R 63V
2636	4822 122 33891	3,3NF10%X7R 63V
2637	5322 121 42498	680NF 5% 63V
2638	5322 121 42498	680NF 5% 63V
2639	5322 122 32531	100PF 5%NP0 50V
2640	5322 122 32531	100PF 5%NP0 50V
2641	4822 124 40246	4,7UF20% 63V
2642	4822 124 40246	4,7UF20% 63V
2643	4822 122 33128	15NF10%X7R 63V
2644	4822 122 33128	15NF10%X7R 63V
2645	5322 122 32448	10PF 5% 50V
2646	5322 122 32448	10PF 5% 50V
2647	4822 124 40246	4,7UF20% 63V
2648	4822 124 40246	4,7UF20% 63V
2691	4822 124 40246	4,7UF20% 63V
2692	4822 124 41584	100UF 20% 10V
2693	4822 124 41525	100UF 20% 25V
2694	4822 124 41525	100UF 20% 25V
2701	4822 122 33195	100PF 10% 50V
2702	4822 122 33195	100PF 10% 50V
2703	4822 122 33195	100PF 10% 50V
2704	4822 122 33195	100PF 10% 50V
2705	5322 122 32531	100PF 5%NP0 50V
2706	5322 122 32531	100PF 5%NP0 50V
2707	5322 122 34099	470PF10%X7R 63V
2708	5322 122 34099	470PF10%X7R 63V
2709	5322 122 32531	100PF 5%NP0 50V
2710	5322 122 32531	100PF 5%NP0 50V
2711	4822 122 33195	100PF 10% 50V
2712	4822 122 33195	100PF 10% 50V
2713	4822 124 41579	10UF 20% 50V
2714	4822 124 41579	10UF 20% 50V
2715	4822 124 41584	100UF 20% 10V
2716	4822 124 41584	100UF 20% 10V
2717	4822 126 12339	2,2NF10% Y5R
2718	4822 126 12339	2,2NF10% Y5R
2719	4822 122 33893	18NF10%X7R 63V
2720	4822 122 33893	18NF10%X7R 63V
2721	4822 122 33342	33NF10%X7R 63V
2722	4822 126 13174	33NF+80-20% 16V

ELECTRICAL PARTSLIST COMBI BOARD

CAPACITORS

2723	4822 126 10326	180PF 5%NP0 63V
2724	4822 126 10326	180PF 5%NP0 63V
2725	4822 122 33575	220PF 5%NPO 50V
2726	4822 122 33575	220PF 5%NPO 50V
2727	4822 122 10459	560PF 10% 50V
2728	4822 122 33173	560PF 10% X7R 50V
2729	4822 122 32541	27NF10%X7R 63V
2730	4822 122 32541	27NF10%X7R 63V
2733	4822 124 41407	0,47UF 20% 63V
2734	4822 124 41407	0,47UF 20% 63V
2735	4822 126 13174	33NF+80-20% 16V
2737	4822 126 10002	100NF20%Y5V 25V
2738	4822 126 10002	100NF20%Y5V 25V
2752	5322 122 32654	22NF10%X7R 63V
2760	4822 122 33342	33NF10%X7R 63V
2761	4822 124 22263	220UF20% 25V
2762	4822 124 40246	4,7UF20% 63V
2763	4822 124 40433	47UF20% 25V
2765	4822 124 40433	47UF20% 25V
2780	4822 124 40246	4,7UF20% 63V
2781	4822 121 51387	10NF20% 16V
2782	5322 122 31866	6,8NF10%X7R 63V
2783	5322 121 42386	100NF 5% 63V
2784	4822 121 43144	22NF10% 50V
2785	4822 124 41579	10UF 20% 50V
2786	4822 122 33195	100PF 10% 50V
2787	4822 122 33342	33NF10%X7R 63V
2794	4822 126 10002	100NF20%Y5V 25V
2807	4822 126 12339	2,2NF10% Y5R
2831	4822 124 40433	47UF20% 25V
2832	4822 124 40184	1000UF20% 10V
2833	4822 124 40433	47UF20% 25V
2834	5322 126 10794	220PF 5%NP0 63V
2835	5322 126 10794	220PF 5%NP0 63V
2836	5322 126 10794	220PF 5%NP0 63V
2837	5322 126 10794	220PF 5%NP0 63V
2838	5322 126 10794	220PF 5%NP0 63V
2839	5322 126 10794	220PF 5%NP0 63V
2840	4822 122 33496	100NF10%X7R 63V
2843	4822 124 41407	0,47UF 20% 63V
2844	4822 124 41407	0,47UF 20% 63V
2845	4822 126 12339	2,2NF10% Y5R
2846	4822 126 12339	2,2NF10% Y5R
2847	4822 122 33177	10NF 20% X7R 50V
2848	4822 124 40433	47UF20% 25V
2849	4822 124 40433	47UF20% 25V
2850	5322 122 32658	22PF 5% 50V
2851	5322 122 32654	22NF10%X7R 63V
2852	5322 122 32452	47PF 5%NP0 63V
2855	4822 124 40433	47UF20% 25V
2856	4822 126 12944	47NF10%X7R 50V
2858	4822 122 33195	100PF 10% 50V
2859	4822 121 51387	10NF20% 16V
2860	4822 122 33891	3,3NF10%X7R 63V
2862	4822 122 33891	3,3NF10%X7R 63V

RESISTORS

3500	4822 051 20475	4M70 5% 0,1W
3501	4822 051 20223	22K00 5% 0,1W
3502	4822 051 20223	22K00 5% 0,1W
3503	4822 116 52256	2K2 5% 0,5W

RESISTORS

3504	4822 051 20222	2K20 5% 0,1W
3505	4822 116 52234	100K 5% 0,5W
3506	4822 051 20104	100K00 5% 0,1W
3507	4822 116 52283	4K7 5% 0,5W
3508	4822 051 20472	4K70 5% 0,1W
3509	4822 116 83864	10K 5% 0,5W
3510	4822 051 20103	10K00 5% 0,1W
3511	4822 116 52271	33K 5% 0,5W
3512	4822 116 52271	33K
3513	4822 051 20154	150K00 5% 0,1W
3514	4822 051 20154	150K00 5% 0,1W
3515	4822 051 20153	15K
3547	4822 051 20184	180K
3517	4822 116 52175	100E 5% 0,5W
3518	4822 116 52195	47E 5% 0,5W
3519	4822 116 52195	47E 5% 0,5W
3520	4822 116 52175	100E 5% 0,5W
3521	4822 050 11002	1K00 1% 0,4W
3522	4822 051 10102	1K00 2% 0,25W
3523	4822 051 20472	4K70 5% 0,1W
3524	4822 051 20223	22K00 5% 0,1W
3527	4822 116 52284	47K 5% 0,5W
3528	4822 051 20473	47K00 5% 0,1W
3529	4822 051 20393	39K00 5% 0,1W
3530	4822 051 20393	39K00 5% 0,1W
3531	4822 116 52269	3K3 5% 0,5W
3532	4822 051 20332	3K30 5% 0,1W
3533	4822 051 20562	5K60 5% 0,1W
3534	4822 051 20562	5K60 5% 0,1W
3535	4822 116 52283	4K7 5% 0,5W
3536	4822 116 52283	4K7 5% 0,5W
3537	4822 051 20474	470K00 5% 0,1W
3538	4822 051 20474	470K00 5% 0,1W
3539	4822 051 20225	2M20 5% 0,1W
3540	4822 051 20101	100R00 5% 0,1W
3541	4822 050 11002	1K00 1% 0,4W
3543	4822 050 11002	1K00 1% 0,4W
3544	4822 050 11002	1K00 1% 0,4W
3545	4822 051 20104	100K00 5% 0,1W
3548	4822 051 20184	180K
3549	4822 051 20224	220K00 5% 0,1W
3551	4822 116 52289	5K6 5% 0,5W
3552	4822 051 20562	5K60 5% 0,1W
3553	4822 116 52285	470K 5% 0,5W
3554	4822 051 20474	470K00 5% 0,1W
3555	4822 051 20564	560K00 5% 0,1W
3556	4822 051 20564	560K00 5% 0,1W
3557	4822 116 83864	10K 5% 0,5W
3558	4822 116 83864	10K 5% 0,5W
3559	4822 116 52269	3K3 5% 0,5W
3560	4822 116 52269	3K3 5% 0,5W
3563	4822 116 52235	1M 5% 0,5W
3564	4822 116 52235	1M 5% 0,5W
3565	4822 116 83864	10K 5% 0,5W
3566	4822 116 83864	10K 5% 0,5W
3567	4822 051 20562	5K60 5% 0,1W
3568	4822 051 20562	5K60 5% 0,1W
3569	4822 116 52304	82K 5% 0,5W
3570	4822 116 52304	82K 5% 0,5W
3572	4822 051 20224	220K00 5% 0,1W

ELECTRICAL PARTSLIST COMBI BOARD

RESISTORS

3573	4822 117 11383	12K
3574	4822 117 11383	12K
3576	4822 051 20124	120K
3577	4822 050 11002	1K00 1% 0,4W
3578	4822 050 11002	1K00 1% 0,4W
3580	4822 052 10339	33R00 5% 0,33W
3583	4822 051 20562	5K60 5% 0,1W
3584	4822 051 20562	5K60 5% 0,1W
3585	4822 051 20274	270K00 5% 0,1W
3586	4822 116 83878	270K 5% 0,5W
3589	4822 050 11002	1K00 1% 0,4W
3590	4822 051 20222	2K2
3591	4822 051 20562	5K60 5% 0,1W
3592	4822 051 20562	5K60 5% 0,1W
3593	4822 116 52224	470E 5% 0,5W
3594	4822 116 52224	470E 5% 0,5W
3595	4822 116 83878	270K 5% 0,5W
3596	4822 116 83878	270K 5% 0,5W
3597	4822 051 20562	5K60 5% 0,1W
3598	4822 051 20562	5K60 5% 0,1W
3600	4822 116 52284	47K 5% 0,5W
3601	4822 116 52235	1M 5% 0,5W
3605	4822 051 20103	10K00 5% 0,1W
3606	4822 051 20473	47K00 5% 0,1W
3607	4822 051 20473	47K00 5% 0,1W
3609	4822 051 20103	10K00 5% 0,1W
3621	4822 116 52283	4K7 5% 0,5W
3622	4822 116 52283	4K7 5% 0,5W
3623	4822 051 20223	22K00 5% 0,1W
3624	4822 116 52257	22K 5% 0,5W
3625	4822 051 20103	10K00 5% 0,1W
3626	4822 051 20103	10K00 5% 0,1W
3631	4822 116 52284	47K 5% 0,5W
3632	4822 116 52284	47K 5% 0,5W
3633	4822 051 20682	6K80 5% 0,1W
3634	4822 051 20682	6K80 5% 0,1W
3635	4822 100 20166	10K 30%LIN 0,1W
3636	4822 100 20166	10K 30%LIN 0,1W
3637	4822 116 52284	47K 5% 0,5W
3638	4822 051 20473	47K00 5% 0,1W
3639	4822 051 20562	5K60 5% 0,1W
3640	4822 051 20562	5K60 5% 0,1W
3641	4822 100 20166	10K 30%LIN 0,1W
3642	4822 100 20166	10K 30%LIN 0,1W
3643	4822 116 52284	47K 5% 0,5W
3644	4822 051 20473	47K00 5% 0,1W
3645	4822 051 20393	39K00 5% 0,1W
3646	4822 116 83882	39K 5% 0,5W
3647	4822 051 20332	3K30 5% 0,1W
3648	4822 051 20332	3K30 5% 0,1W
3649	4822 051 20562	5K60 5% 0,1W
3650	4822 051 20562	5K60 5% 0,1W
3651	4822 051 10102	1K00 2% 0,25W
3652	4822 051 10102	1K00 2% 0,25W
3653	4822 050 11002	1K00 1% 0,4W
3654	4822 050 11002	1K00 1% 0,4W
3655	4822 100 20166	10K 30%LIN 0,1W
3656	4822 100 20166	10K 30%LIN 0,1W
3657	4822 051 10102	1K00 2% 0,25W
3658	4822 051 10102	1K00 2% 0,25W
3659	4822 051 20333	33K00 5% 0,1W
3660	4822 116 52271	33K 5% 0,5W

RESISTORS

3661	4822 051 20334	330K00 5% 0,1W
3662	4822 051 20334	330K00 5% 0,1W
3663	4822 116 52252	180K 5% 0,5W
3664	4822 116 52252	180K 5% 0,5W
3665	4822 117 11149	82K 1% 0,1W
3666	4822 117 11149	82K 1% 0,1W
3671	4822 050 11002	1K00 1% 0,4W
3672	4822 116 52234	100K 5% 0,5W
3673	4822 051 10102	1K00 2% 0,25W
3674	4822 051 10102	1K00 2% 0,25W
3675	4822 051 10102	1K00 2% 0,25W
3676	4822 051 10102	1K00 2% 0,25W
3677	4822 051 20473	47K00 5% 0,1W
3678	4822 051 10102	1K00 2% 0,25W
3679	4822 116 52284	47K 5% 0,5W
3680	4822 051 20472	4K70 5% 0,1W
3681	4822 116 52283	4K7 5% 0,5W
3682	4822 100 20166	10K 30%LIN 0,1W
3683	4822 051 20562	5K60 5% 0,1W
3684	4822 100 20166	10K 30%LIN 0,1W
3685	4822 051 20472	4K70 5% 0,1W
3686	4822 116 52284	47K 5% 0,5W
3688	4822 116 52234	100K 5% 0,5W
3689	4822 051 20104	100K00 5% 0,1W
3690	4822 116 83864	10K 5% 0,5W
3691	4822 116 83864	10K 5% 0,5W
3692	4822 117 11746	43K RC12H1% 0,1W
3693	4822 051 20689	68R00 5% 0,1W
3694	4822 052 10109	10R00 5% 0,33W
3695	4822 051 20689	68R00 5% 0,1W
3701	4822 051 20221	220R00 5% 0,1W
3702	4822 051 20221	220R00 5% 0,1W
3703	4822 051 20221	220R00 5% 0,1W
3704	4822 051 20221	220R00 5% 0,1W
3705	4822 116 52215	220E 5% 0,5W
3706	4822 116 52215	220E 5% 0,5W
3707	4822 051 20101	100R00 5% 0,1W
3708	4822 051 20101	100R00 5% 0,1W
3709	4822 051 20229	22R00 5% 0,1W
3710	4822 051 20229	22R00 5% 0,1W
3711	4822 051 20184	180K00 5% 0,1W
3712	4822 051 20184	180K00 5% 0,1W
3713	4822 051 20109	10R00 5% 0,1W
3714	4822 051 20109	10R00 5% 0,1W
3715	4822 116 52249	1K8 5% 0,5W
3716	4822 051 20182	1K80 5% 0,1W
3717	4822 116 52276	3K9 5% 0,5W
3718	4822 116 52276	3K9 5% 0,5W
3719	4822 117 11383	12K 1% 0,1W
3720	4822 117 11383	12K 1% 0,1W
3721	4822 051 20562	5K60 5% 0,1W
3722	4822 051 20562	5K60 5% 0,1W
3723	4822 116 52238	12K 5% 0,5W
3724	4822 117 11383	12K 1% 0,1W
3725	4822 051 20224	220K00 5% 0,1W
3726	4822 051 20224	220K00 5% 0,1W
3727	4822 051 20562	5K60 5% 0,1W
3728	4822 051 20562	5K60 5% 0,1W
3729	4822 051 20272	2K70 5% 0,1W
3730	4822 051 20272	2K70 5% 0,1W
3731	4822 051 20682	6K80 5% 0,1W
3732	4822 051 20682	6K80 5% 0,1W

ELECTRICAL PARTSLIST COMBI BOARD

RESISTORS

3733	4822 116 52219	330R
3734	4822 116 52219	330R
3735	4822 116 52251	18K 5% 0,5W
3736	4822 116 52251	18K 5% 0,5W
3737	4822 051 20332	3K30 5% 0,1W
3738	4822 116 52269	3K3 5% 0,5W
3739	4822 051 20121	120R00 5% 0,1W
3740	4822 116 52284	47K 5% 0,5W
3741	4822 050 11002	1K00 1% 0,4W
3742	4822 116 52234	100K 5% 0,5W
3744	4822 051 20153	15K00 5% 0,1W
3745	4822 051 10102	1K00 2% 0,25W
3746	4822 051 10102	1K00 2% 0,25W
3747	4822 051 20104	100K00 5% 0,1W
3749	4822 051 10102	1K00 2% 0,25W
3759	4822 050 11002	1K00 1% 0,4W
3760	4822 051 20104	100K00 5% 0,1W
3761	4822 116 83864	10K 5% 0,5W
3762	4822 051 20821	820R00 5% 0,1W
3763	4822 051 20184	180K00 5% 0,1W
3764	4822 051 20471	470R00 5% 0,1W
3765	4822 116 52284	47K 5% 0,5W
3766	4822 051 20475	4M70 5% 0,1W
3767	4822 051 20223	22K00 5% 0,1W
3768	4822 116 52285	470K 5% 0,5W
3769	4822 051 20475	4M70 5% 0,1W
3770	4822 116 52243	1K5 5% 0,5W
3771	4822 051 10102	1K00 2% 0,25W
3772	4822 051 20183	18K00 5% 0,1W
3773	4822 100 20166	10K 30%LIN 0,1W
3774	4822 051 20223	22K00 5% 0,1W
3775	4822 116 52186	22E 5% 0,5W
3776	4822 116 52296	6K8 5% 0,5W
3777	4822 116 83868	150R 5% 0,5W
3778	4822 051 20828	8R20 5% 0,1W
3779	4822 051 20334	330K00 5% 0,1W
3780	4822 051 20105	1M00 5% 0,1W
3781	4822 051 20475	4M70 5% 0,1W
3782	4822 051 20472	4K70 5% 0,1W
3783	4822 051 20472	4K70 5% 0,1W
3784	4822 051 20153	15K00 5% 0,1W
3785	4822 100 11163	100K 30%LIN 0,1W
3786	4822 116 52256	2K2 5% 0,5W
3787	4822 051 20105	1M00 5% 0,1W
3788	4822 116 52235	1M 5% 0,5W
3789	4822 116 52257	22K 5% 0,5W
3795	4822 051 20103	10K00 5% 0,1W
3796	4822 050 11002	1K00 1% 0,4W
3797	4822 116 52234	100K 5% 0,5W
3811	4822 051 10102	1K00 2% 0,25W
3841	4822 116 52176	10E 5% 0,5W
3842	4822 051 20221	220R00 5% 0,1W
3843	4822 051 20221	220R00 5% 0,1W
3844	4822 051 20221	220R00 5% 0,1W
3845	4822 116 83864	10K 5% 0,5W
3846	4822 116 83864	10K 5% 0,5W
3847	4822 116 83864	10K 5% 0,5W
3848	4822 116 83864	10K 5% 0,5W
3849	4822 051 20222	2K20 5% 0,1W
3851	4822 051 20103	10K00 5% 0,1W
3852	4822 051 20103	10K00 5% 0,1W
3854	4822 116 52215	220E 5% 0,5W

RESISTORS

3855	4822 116 52256	2K2 5% 0,5W
3856	4822 051 20223	22K00 5% 0,1W
3857	4822 116 83864	10K 5% 0,5W
3858	4822 116 83864	10K 5% 0,5W
3859	4822 051 20229	22R00 5% 0,1W
3860	4822 051 20101	100R00 5% 0,1W
3861	4822 051 20103	10K00 5% 0,1W
3862	4822 051 20105	1M00 5% 0,1W
3863	4822 116 52176	10E 5% 0,5W
3864	4822 051 20229	22R00 5% 0,1W
3865	4822 051 20103	10K00 5% 0,1W
3866	4822 116 52219	330E 5% 0,5W
3867	4822 051 20221	220R00 5% 0,1W
3868	4822 116 52176	10E 5% 0,5W
3869	4822 051 20103	10K00 5% 0,1W
3870	4822 116 52243	1K5 5% 0,5W
3871	4822 116 52186	22E 5% 0,5W
3872	4822 051 20222	2K20 5% 0,1W
3873	4822 116 90835	10Kx7(resnet)0,125W
3874	4822 051 20103	10K00 5% 0,1W
3875	4822 116 52243	1K5 5% 0,5W
3876	4822 117 11139	1K5 1% 0,1W
3877	4822 051 20222	2K20 5% 0,1W
3878	4822 051 20105	1M00 5% 0,1W
3879	4822 051 20154	150K00 5% 0,1W
3880	4822 051 20393	39K00 5% 0,1W
3881	4822 051 20333	33K00 5% 0,1W
3882	4822 051 10102	1K00 2% 0,25W
3883	4822 051 20122	1K20 5% 0,1W
3884	4822 051 10102	1K00 2% 0,25W
3885	4822 051 10102	1K00 2% 0,25W
3891	4822 052 10338	3R30 5% 0,33W
3895	4822 116 52264	27K 5% 0,5W
3896	4822 116 52251	18K 5% 0,5W
3897	4822 116 52251	18K 5% 0,5W
3898	4822 116 83882	39K 5% 0,5W
3899	4822 116 83882	39K 5% 0,5W
4500	4822 051 20008	0R00 JUMP. (0805)
4501	4822 051 10008	0R00 5% 0,25W
4502	4822 051 10008	0R00 5% 0,25W
4503	4822 051 10008	0R00 5% 0,25W
4506	4822 051 10008	0R00 5% 0,25W
4510	4822 051 10008	0R00 5% 0,25W
4511	4822 051 10008	0R00 5% 0,25W
4516	4822 051 10008	0R00 5% 0,25W
4517	4822 051 10008	0R00 5% 0,25W
4518	4822 051 10008	0R00 5% 0,25W
4520	4822 051 20008	0R00 JUMP. (0805)
4521	4822 051 10008	0R00 5% 0,25W
4523	4822 051 10008	0R00 5% 0,25W
4524	4822 051 10008	0R00 5% 0,25W
4525	4822 051 10008	0R00 5% 0,25W
4526	4822 051 10008	0R00 5% 0,25W
4527	4822 051 10008	0R00 5% 0,25W
4529	4822 051 10008	0R00 5% 0,25W
4530	4822 051 10008	0R00 5% 0,25W
4531	4822 051 20008	0R00 JUMP. (0805)
4533	4822 051 20008	0R00 JUMP. (0805)
4534	4822 051 10008	0R00 5% 0,25W
4535	4822 051 10008	0R00 5% 0,25W

ELECTRICAL PARTSLIST COMBI BOARD

RESISTORS

4536	4822 051 10008	0R00 5% 0,25W
4537	4822 051 10008	0R00 5% 0,25W
4538	4822 051 10008	0R00 5% 0,25W
4540	4822 051 10008	0R00 5% 0,25W
4541	4822 051 20008	0R00 JUMP. (0805)
4542	4822 051 10008	0R00 5% 0,25W
4543	4822 051 10008	0R00 5% 0,25W
4545	4822 051 10008	0R00 5% 0,25W
4546	4822 051 10008	0R00 5% 0,25W
4547	4822 051 10008	0R00 5% 0,25W
4548	4822 051 10008	0R00 5% 0,25W
4549	4822 051 10008	0R00 5% 0,25W
4550	4822 051 20008	0R00 JUMP. (0805)
4555	4822 116 52289	5K6
4557	4822 051 10008	0R00 5% 0,25W
4559	4822 051 10008	0R00 5% 0,25W
4565	4822 051 20008	0R00 JUMP. (0805)
4566	4822 051 10008	0R00 5% 0,25W
4568	4822 051 10008	0R00 5% 0,25W
4572	4822 051 10008	0R00 5% 0,25W
4574	4822 051 10008	0R00 5% 0,25W
4577	4822 051 20008	0R00 JUMP. (0805)
4578	4822 051 10008	0R00 5% 0,25W
4579	4822 051 20008	0R00 JUMP. (0805)
4597	4822 051 10008	0R00 5% 0,25W
4599	4822 051 20008	0R00 JUMP. (0805)
4630	4822 050 11002	1K00 1% 0,4W
4631	4822 051 20103	10K00 5% 0,1W
4632	4822 051 10102	1K00 2% 0,25W
4633	4822 051 10102	1K00 2% 0,25W
4634	4822 051 10102	1K00 2% 0,25W
4635	4822 051 10102	1K00 2% 0,25W
4636	4822 051 10102	1K00 2% 0,25W
4637	4822 051 10102	1K00 2% 0,25W
4638	4822 051 10102	1K00 2% 0,25W
4639	4822 051 10102	1K00 2% 0,25W
4640	4822 051 10102	1K00 2% 0,25W
4641	4822 051 10102	1K00 2% 0,25W
4642	4822 051 10102	1K00 2% 0,25W
4643	4822 051 10102	1K00 2% 0,25W
4644	4822 051 10102	1K00 2% 0,25W
4645	4822 051 10102	1K00 2% 0,25W
4646	4822 051 10102	1K00 2% 0,25W
4647	4822 051 10102	1K00 2% 0,25W
4648	4822 051 10102	1K00 2% 0,25W
4649	4822 051 10102	1K00 2% 0,25W
4650	4822 051 10102	1K00 2% 0,25W
4651	4822 051 10102	1K00 2% 0,25W
4652	4822 051 10102	1K00 2% 0,25W
4653	4822 051 20473	47K00 5% 0,1W
4654	4822 050 11002	1K00 1% 0,4W
4655	4822 050 11002	1K00 1% 0,4W
4656	4822 050 11002	1K00 1% 0,4W
4657	4822 050 11002	1K00 1% 0,4W
4658	4822 051 10102	1K00 2% 0,25W
4659	4822 051 20221	220R00 5% 0,1W
4660	4822 051 10102	1K00 2% 0,25W
4661	4822 051 10102	1K00 2% 0,25W
4662	4822 051 20472	4K70 5% 0,1W

RESISTORS

4663	4822 051 20472	4K70 5% 0,1W
4664	4822 051 20222	2K20 5% 0,1W
4665	4822 051 20103	10K00 5% 0,1W
4666	4822 051 20222	2K20 5% 0,1W
4667	4822 051 20472	4K70 5% 0,1W
4668	4822 050 11002	1K00 1% 0,4W
4670	4822 051 20103	10K00 5% 0,1W
4671	4822 050 11002	1K00 1% 0,4W
4672	4822 050 11002	1K00 1% 0,4W
4673	4822 050 11002	1K00 1% 0,4W
4674	4822 051 10102	1K00 2% 0,25W
4675	4822 051 20273	27K00 5% 0,1W
4676	4822 051 10102	1K00 2% 0,25W
4677	4822 050 11002	1K00 1% 0,4W
4678	4822 051 10102	1K00 2% 0,25W
4679	4822 050 11002	1K00 1% 0,4W
4680	4822 050 11002	1K00 1% 0,4W
4681	4822 051 20472	4K70 5% 0,1W
4682	4822 051 10102	1K00 2% 0,25W
4683	4822 051 20103	10K00 5% 0,1W
4684	4822 116 52256	2K2 5% 0,5W
4685	4822 116 52256	2K2 5% 0,5W
4686	4822 050 11002	1K00 1% 0,4W
4687	4822 051 20472	4K70 5% 0,1W
4688	4822 051 20223	22K00 5% 0,1W
4689	4822 051 10102	1K00 2% 0,25W
4690	4822 051 20471	470R00 5% 0,1W
4691	4822 051 20472	4K70 5% 0,1W
4692	4822 050 11002	1K00 1% 0,4W
4693	4822 116 52234	100K
4694	4822 051 10102	1K00 2% 0,25W
4695	4822 050 11002	1K00 1% 0,4W
4696	4822 051 20221	220R00 5% 0,1W
4697	4822 051 10102	1K00 2% 0,25W
4698	4822 051 20221	220R00 5% 0,1W
4699	4822 051 20221	220R00 5% 0,1W
4700	4822 051 20221	220R00 5% 0,1W
4701	4822 051 10102	1K00 2% 0,25W
4702	4822 051 20008	0R00 JUMP. (0805)
4703	4822 051 10102	1K00 2% 0,25W
4704	4822 051 10102	1K00 2% 0,25W
4705	4822 051 10008	0R00 5% 0,25W
4707	4822 050 11002	1K00 1% 0,4W
4708	4822 050 11002	1K00 1% 0,4W
4709	4822 050 11002	1K00 1% 0,4W
4710	4822 051 10102	1K00 2% 0,25W
4711	4822 051 10102	1K00 2% 0,25W
4712	4822 051 10102	1K00 2% 0,25W
4713	4822 051 10102	1K00 2% 0,25W
4716	4822 051 10102	1K00 2% 0,25W
4718	4822 051 20103	10K00 5% 0,1W
4719	4822 051 20103	10K00 5% 0,1W
4720	4822 116 52278	390K 5% 0,5W
4721	4822 051 20104	100K00 5% 0,1W
4801	4822 051 20008	0R00 JUMP. (0805)
4802	4822 051 20008	0R00 JUMP. (0805)
4803	4822 051 10008	0R00 5% 0,25W
4804	4822 051 10008	0R00 5% 0,25W
4805	4822 051 10008	0R00 5% 0,25W
4895	4822 051 20008	0R00 JUMP. only for /22
4895	4822 051 10008	0R00 0,25W only for /21

ELECTRICAL PARTSLIST COMBI BOARD

COILS

5501	4822 157 50964	100µH
5631	4822 156 21725	MPX FILTER
5632	4822 156 21725	MPX FILTER
5701	4822 156 20946	OSC.COIL 100kHz
5790	4822 156 21721	2,2µH
5791	5322 242 73697	CER.RES.8MHz
5860	4822 242 81865	CER.RES.16,93MHz
5862	4822 156 21721	2,2µH
5863	4822 157 50964	100µH

DIODES

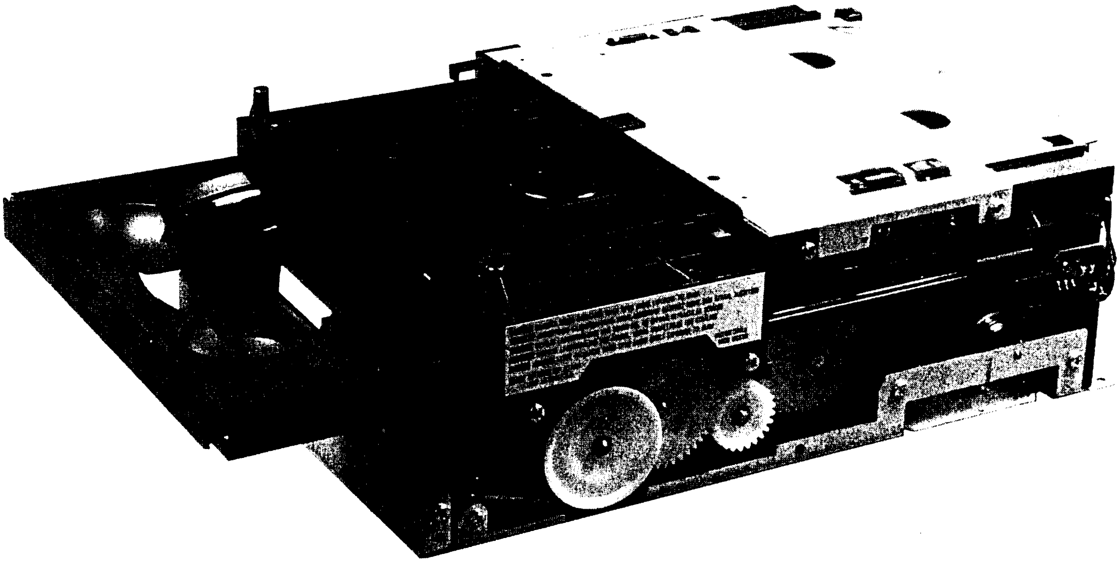
6651	4822 130 30621	1N4148 (COL)
6760	4822 130 34382	BZX79-C8V2
6761	4822 130 30621	1N4148 (COL)
6762	4822 130 30621	1N4148 (COL)
6772	4822 130 30621	1N4148 (COL)
6773	4822 130 30621	1N4148 (COL)
6774	4822 130 30621	1N4148 (COL)
6775	4822 130 30621	1N4148 (COL)
6776	4822 130 30621	1N4148 (COL)
6777	4822 130 34382	BZX79-F8V2 (COL)
6778	4822 130 30621	1N4148 (COL)
6790	5322 130 30684	1N4002GP (UAW)
6791	5322 130 30684	1N4002GP (UAW)
6792	4822 130 30621	1N4148 (COL)
6857	4822 130 34167	BZX79-B6V2

TRANSISTORS & IC's

7501	4822 209 31378	NJM4556AM
7502	5322 130 42136	BC848C (UAW)
7503	4822 130 42615	BC817-40 (UAW)
7504	4822 130 42615	BC817-40 (UAW)
7505	5322 130 42136	BC848C (UAW)
7507	4822 209 83357	NJM4560M
7512	4822 130 42513	BC858C (UAW)
7513	5322 130 42136	BC848C (UAW)
7514	5322 130 42136	BC848C (UAW)
7515	5322 130 42136	BC848C (UAW)
7516	5322 130 42136	BC848C (UAW)
7553	4822 209 33652	TEA6321T/V1
7630	4822 209 90406	CXA1101M
7631	5322 130 42136	BC848C (UAW)
7632	5322 130 42136	BC848C (UAW)
7634	5322 130 42136	BC848C (UAW)
7640	4822 209 83357	NJM4560M
7650	5322 130 42136	BC848C (UAW)
7651	4822 130 42513	BC858C (UAW)
7652	5322 130 42136	BC848C (UAW)
7653	5322 130 60123	BC807-40 (UAW)
7654	5322 130 42136	BC848C (UAW)
7655	5322 130 60123	BC807-40 (UAW)
7661	5322 130 60123	BC807-40 (UAW)
7662	5322 130 42136	BC848C (UAW)
7663	4822 130 40982	BD437
7001	4822 130 40982	BD437
7690	4822 209 13035	TMP87CN71F
7701	5322 130 42136	BC848C (UAW)
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT

TRANSISTORS & IC's

7780	5322 130 42136	BC848C (UAW)
7781	5322 130 42136	BC848C (UAW)
7782	4822 130 41715	BC328-40 (UAW)
7783	5322 130 42136	BC848C (UAW)
7784	4822 130 60373	BC856B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	4822 130 42513	BC858C (UAW)
7788	4822 130 42513	BC858C (UAW)
7820	4822 130 42615	BC817-40 (UAW)
7850	4822 209 31064	TDA1301T/N2
7851	5322 130 42136	BC848C (UAW)
7856	5322 130 42136	BC848C (UAW)
7860	4822 209 90618	SAA7345GP/S5
7861	4822 209 32196	TDA1311AT/N2
7862	4822 209 32852	TDA7073A/N2



CD CHANGER UNIT CDC7

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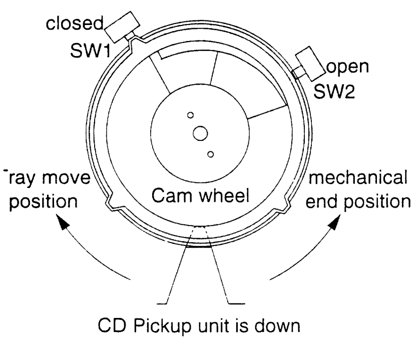
Overview of the CDC-7 mechanism

The CDC-7 mechanism is a tray-loader system with an elevator called “stocker” in its back that can hold up to 7 discs. The CD-ickup unit (CDM12.1 mechanism) is in the middle of the CDC-7 mechanism.

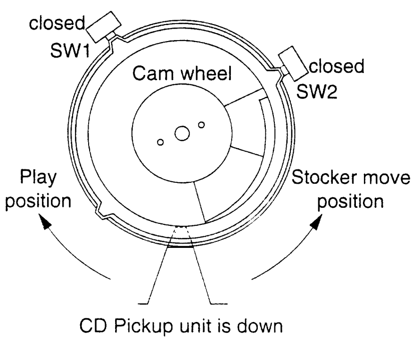
The tray motor is responsible for movement of tray and stocker. Which part it moves depends on a clutch, controlled by a cam wheel in the middle of the CDC-7 mechanism. The Cam wheel lifts or lowers also the Disc lock pin and the CD pickup unit. The am wheel is driven by the cam motor and has 3 positions, called ´PLAY´, ´TRAY MOVE´ and ´STOCKER MOVE´

Cam position	Tray motor	CD pickup unit	Disc lock pin	SW1	SW2	SW3
Stocker move	Drives the stocker up or down	down	up	close	open	open
Tray move	Drives the tray in or out	down	down	close	close	close
Play	-	up	down	open	close	close

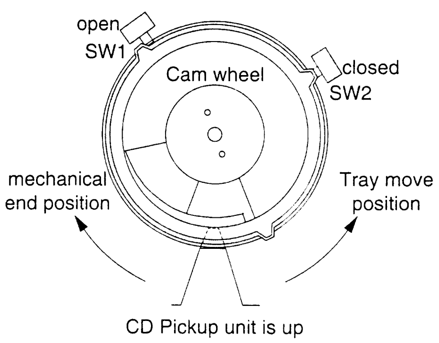
Stocker move position



Tray move position



Play position



The complete operation (including feedback sensing) of the CDC-7 mechanism is controlled by 2 motors, 2 photo sensors and several switches. A quick reference of the switches and sensors' functions are given in the table below:

Name	Activated by	Detects
Eject switch	Outer tray	- Tray open - User´s intention (push tray to close)
Store switch	Shuttle	Carriage is fully in the stocker
Play position over switch	Shuttle	Approximate position for disc play. It actually reverses the tray motion for the disc detect photo reflector to locate the play position.
Disc detect photo reflector	Carriage	Detects a disc
SW1, SW2	Cam wheel	- Cam in ´STOCKER MOVE´ or in ´TRAY MOVE´ position. - CD pickup unit in up or down position.
SW3 (Disc lock)	Disc lock pin	Actual position of the disc lock pin
Home switch	Moving bracket (pos. 23)	Upmost stocker posiion (Disc 1)
Disc count photo interruptor	Moving bracket (pos. 23)	Counts the current carriage (or disc)

Operations

The tray consists of an outer tray which is the same for all discs and an inner carriage for each individual disc. The carriage which actually holds the disc is moved by a tooth-bar called ´SHUTTLE´. Each carriage has a slot in which the shuttle engages when the stocker chooses that particular disc position. The shuttle pulls the carriage out of the stocker. When it reaches the outer tray, both the outer tray and carriage opens. All the movements are done by the combination of the tray motor, belt and gears. A mechanical locking between the carriage and outer tray prevents accidental separation by the customer. When the tray s closed the shuttle pushes the carriage back in the stocker (if requested). At the right back of the stocker are springs that will hold each carriage in position within the stocker.

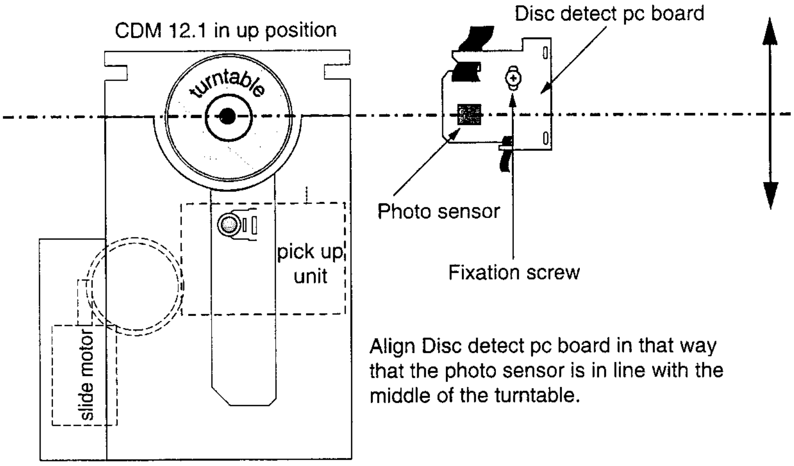
When the carriage is in the stocker, this position is signalled by a switch at the right back called STORE SWITCH. It is pressed by the shuttle when the carriage is completely in the stocker.

The open position of the tray is given by an EJECT SWITCH. This eject switch at left front is actuated when the tray has fully opened. This switch also indicates the customer's intention to close the tray when he pushes the tray inside.

To find the PLAY POSITION (center position) of the carriage (disc) there is a photo reflector called DISC DETECT on the right middle of the CDC-7 mechanism. This photo reflector is responsible for disc detection. It shines through a very small rectangular hole (1 x 5 mm) in the carriage. Because the photo reflector is used to find the play position it is clear that the *play position cannot be reached without a disc* on the carriage. The hole in the carriage and the position of the photo reflector are pre-aligned in the factory such that accurate play position is achieved at the first photo reflector signal.

Note:The photo reflector must be aligned to the same horizontal centre line as the CDM12.1 turntable spindle. This will ensure the disc to sit accurately during play and prevents any rubbing of the disc against the carriage.

Alignment of photo sensor



Align Disc detect pc board in that way that the photo sensor is in line with the middle of the turntable.

There is an extra switch, called PLAY-POSITION-OVER SWITCH that is triggered by the small latch lever on the outer tray. The carriage moves till the play-position-over switch is triggered and then reverses slowly till the photo-reflector senses that the play position is reached.

The cam motor turns the cam wheel in the center of the CDC-7 mechanism. This cam controls a clutch which selects between tray or stocker movement. It also lifts or lowers the disc-lock pin and the CD-pickup unit. The 3 positions of the cam is given by two switches named SW1 and SW2. At the cam's mechanically blocked end positions both switches are open.

The position of the stocker is monitored by a disc count photo interrupter and a home switch. The disc count interrupter gives a low signal when a disc position is reach and a high signal when the stocker is between two valid positions (or carriages). The home switch gives the location of the uppermost stocker position (disc number 1). The home switch is located on the right of the cam switch SW2. The disc count photo interrupter is immediately next to the right side of the home switch (it is very small!).

Note:If the stocker is between two valid positions, tray movement will be mechanically blocked.

The CDC-7 mechanism has 2 safety features - its ability to detect 2 discs loaded into one carriage and to detect an 8cm CD-Single that is placed off-center on a carriage, obstructing the center hole of the carriage.

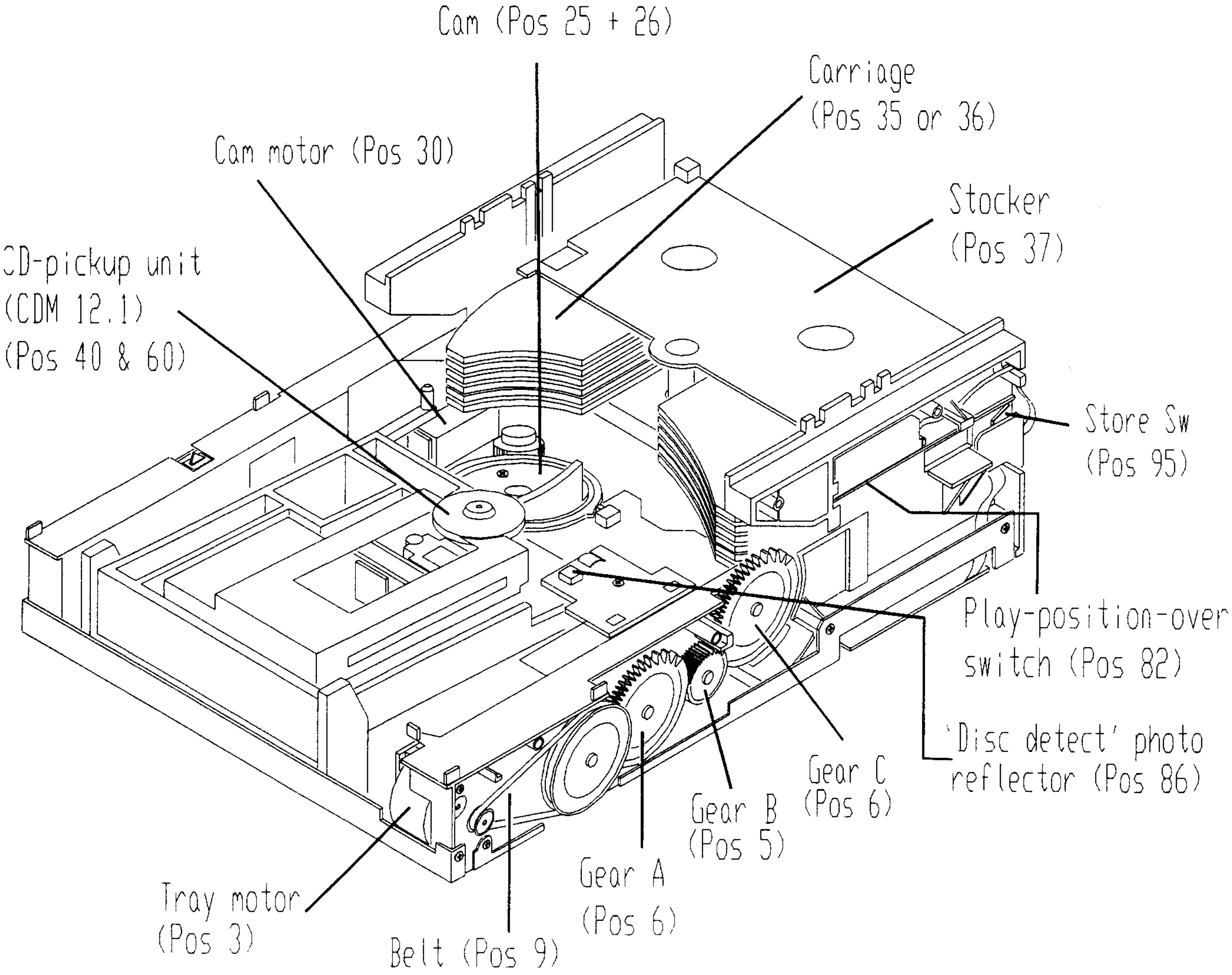
Note:Only disc 1 has a special carriage that can hold either a 12cm or a 8cm disc, all other carriages are designed to carry 12cm discs only!

If two discs are loaded into a single carriage the upper disc cannot go into the stocker because it will be stopped by a pip on left side of the outer tray. The disc-detect photo reflector will also sense the extra disc outside the stocker. When this happens, the same tray with the rejected discs is opened and a message is given on the display.

For further information see Circuit Description CDC7 Changer (4822 725 24764)!

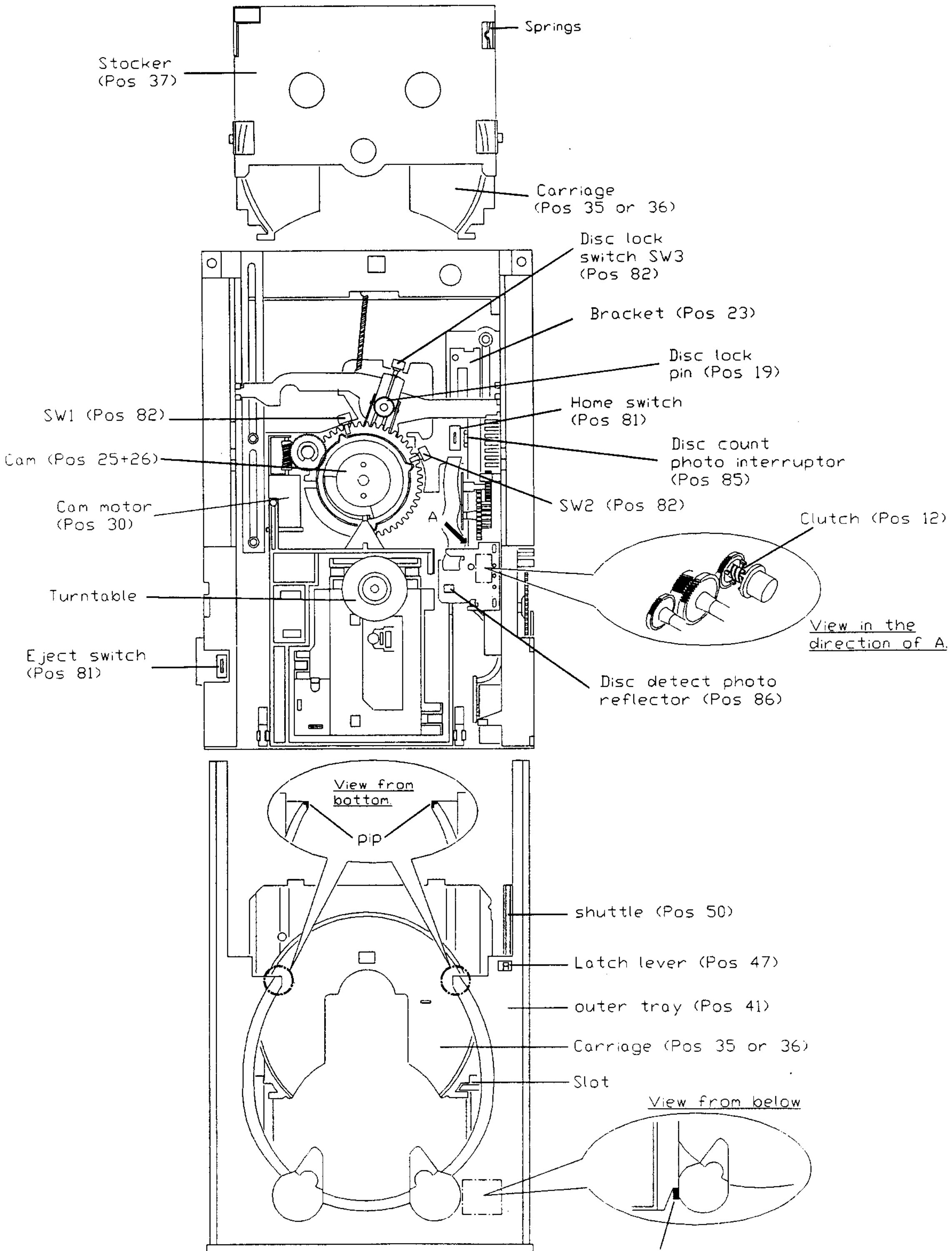
Mechanical overview of CDC7 Module

Identification of parts


Cam (Pos 25 + 26)
Carriage (Pos 35 or 36)
Cam motor (Pos 30)
Stocker (Pos 37)
D-pickup unit (CDM 12.1) (Pos 40 & 60)
Store Sw (Pos 95)
Play-position-over switch (Pos 82)
'Disc detect' photo reflector (Pos 86)
Gear C (Pos 6)
Gear B (Pos 5)
Gear A (Pos 6)
Tray motor (Pos 3)
Belt (Pos 9)

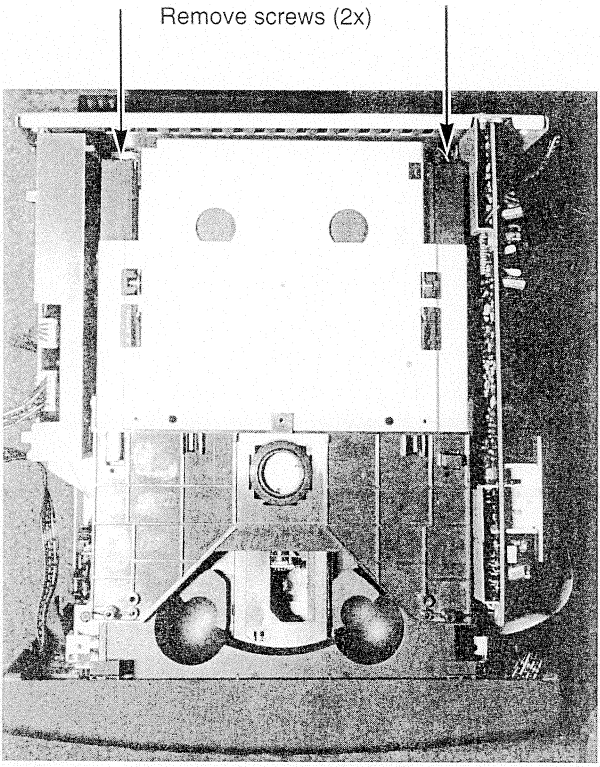
Mechanical overview of CDC7 Module

Identification of parts

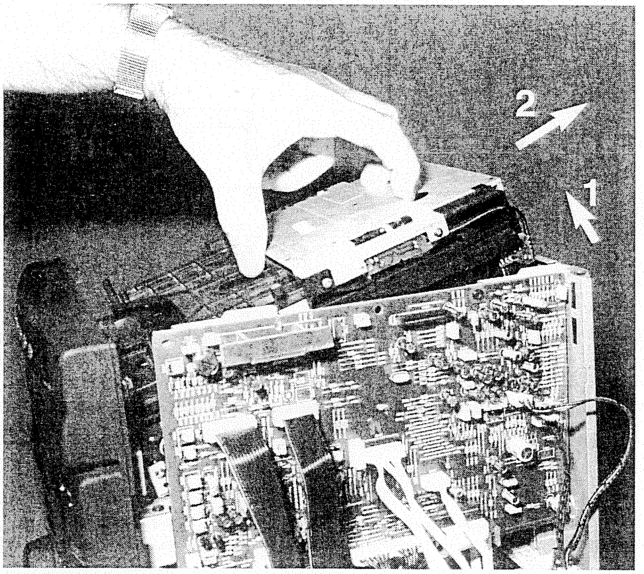

Springs
Stocker (Pos 37)
Carriage (Pos 35 or 36)
Disc lock switch SW3 (Pos 82)
Bracket (Pos 23)
Disc lock pin (Pos 19)
Home switch (Pos 81)
SW1 (Pos 82)
Disc count photo interruptor (Pos 85)
Cam (Pos 25+26)
Cam motor (Pos 30)
SW2 (Pos 82)
Clutch (Pos 12)
A
Turntable
View in the direction of A.
Eject switch (Pos 81)
Disc detect photo reflector (Pos 86)
View from bottom.
pip
shuttle (Pos 50)
Latch lever (Pos 47)
outer tray (Pos 41)
Carriage (Pos 35 or 36)
Slot
View from below
Lock lever (Pos 46)

Dismantling hints

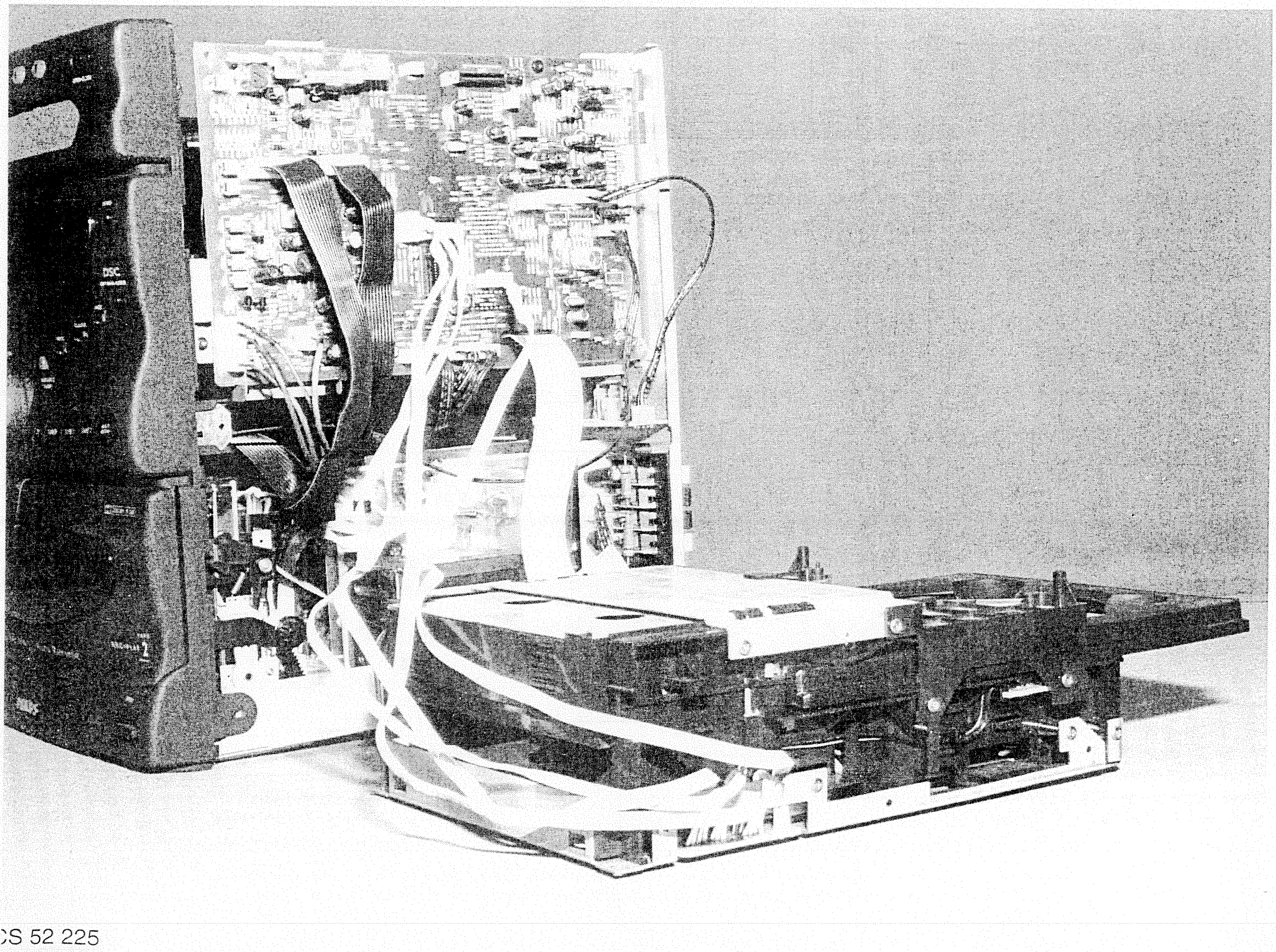
Remove screws (2x)



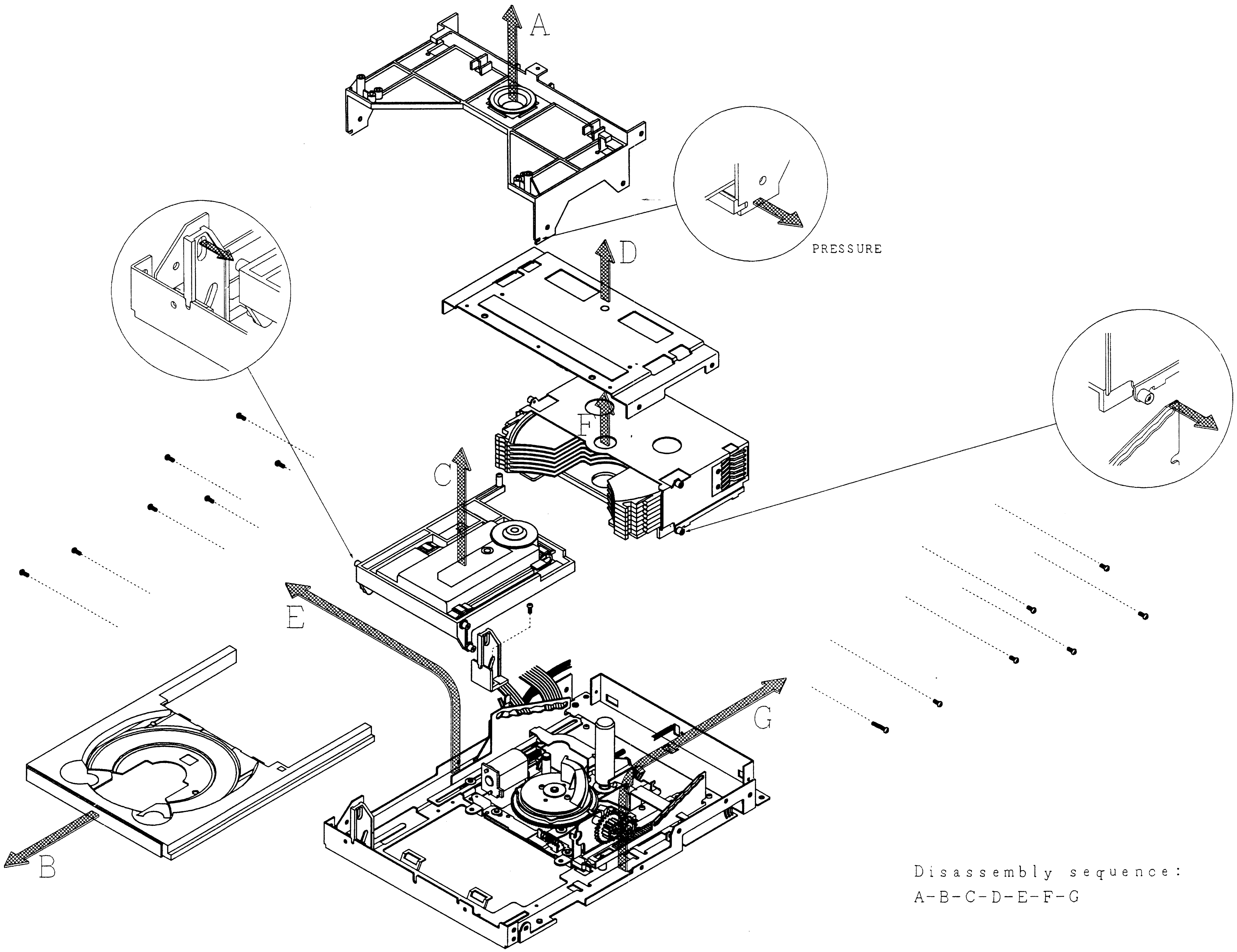
Lift the module on the back side as shown below



Repair position

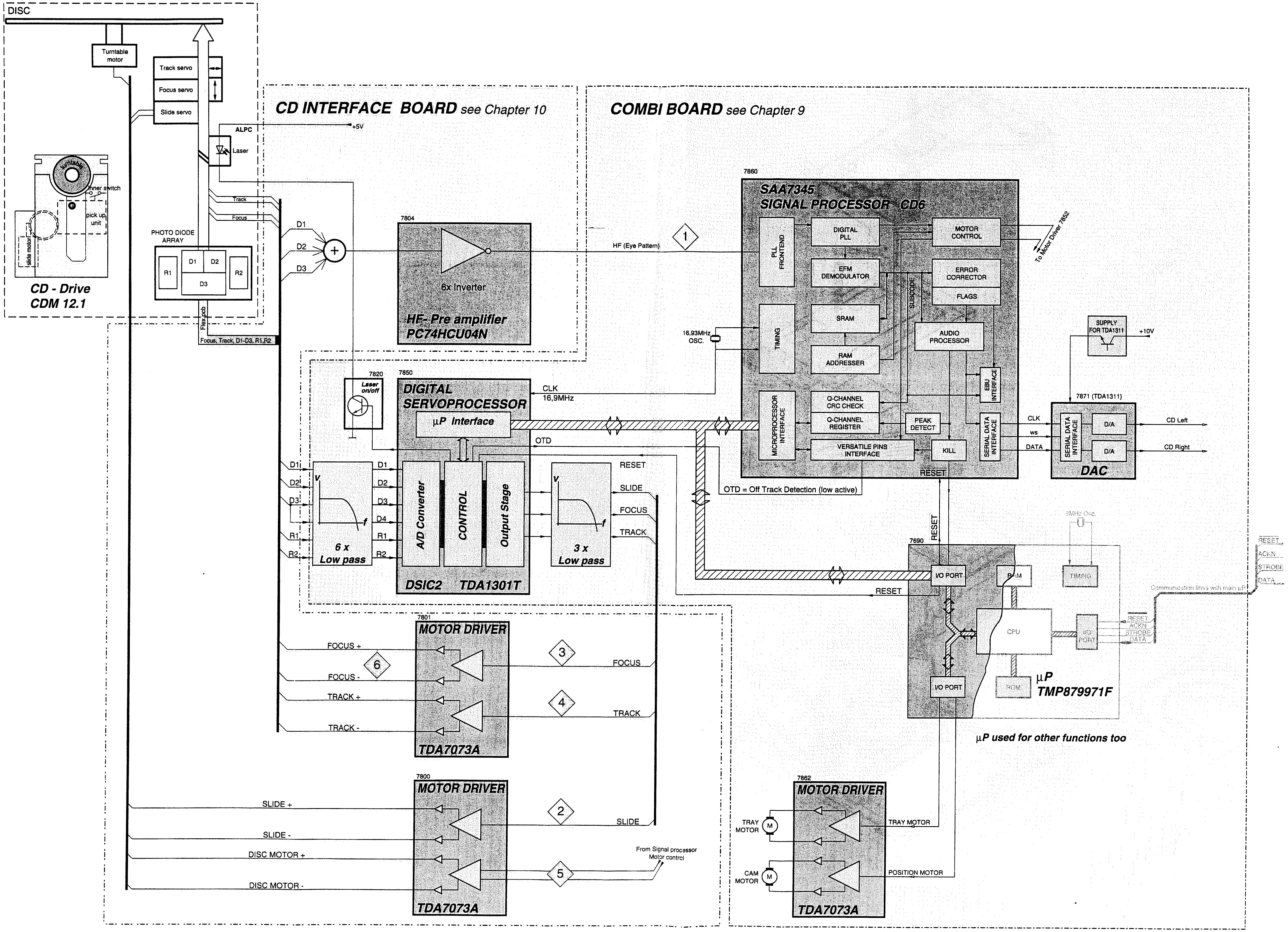


CDC7 Disassembly drawing

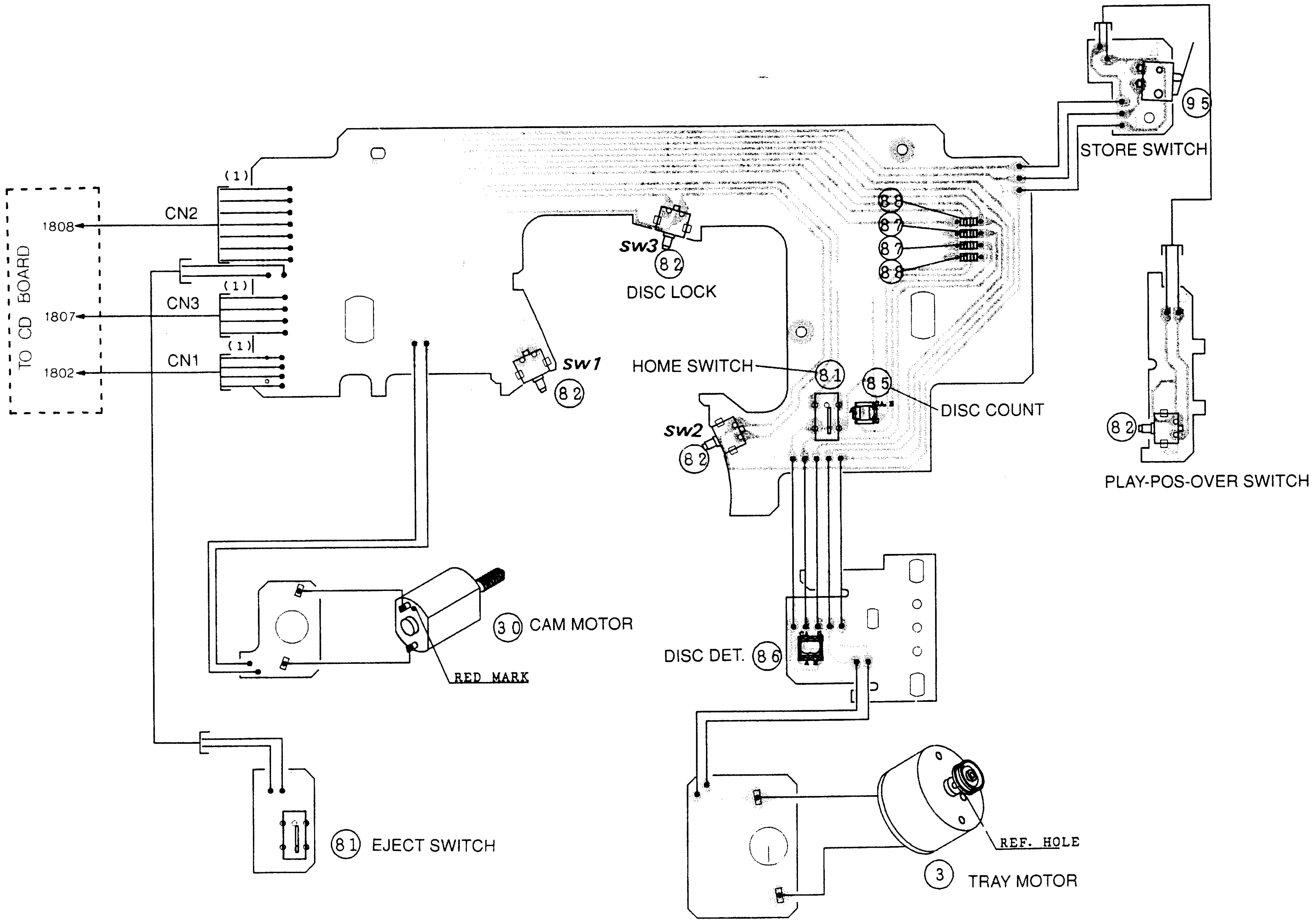

A
PRESSURE
D
F
C
E
G
B

Disassembly sequence:
A-B-C-D-E-F-G

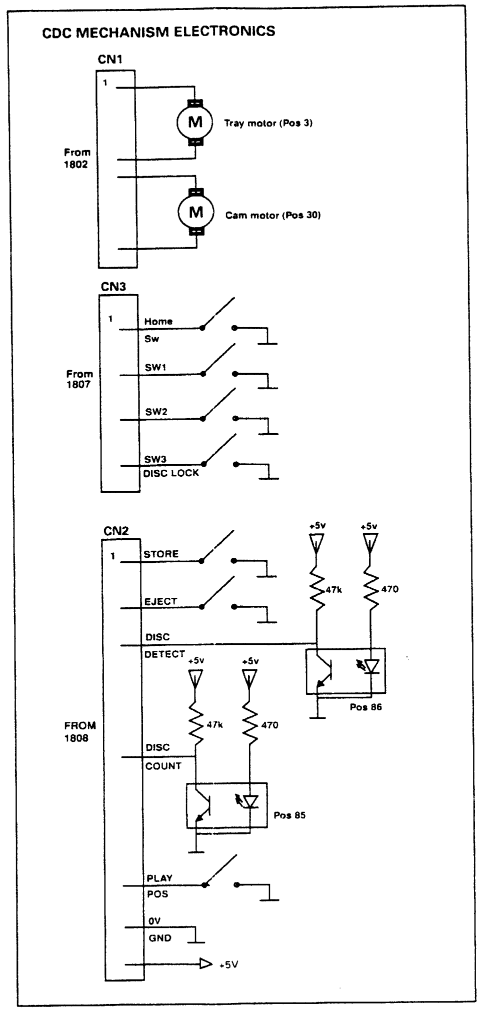
FUNCTIONAL DIAGRAM *CDC7 Module*

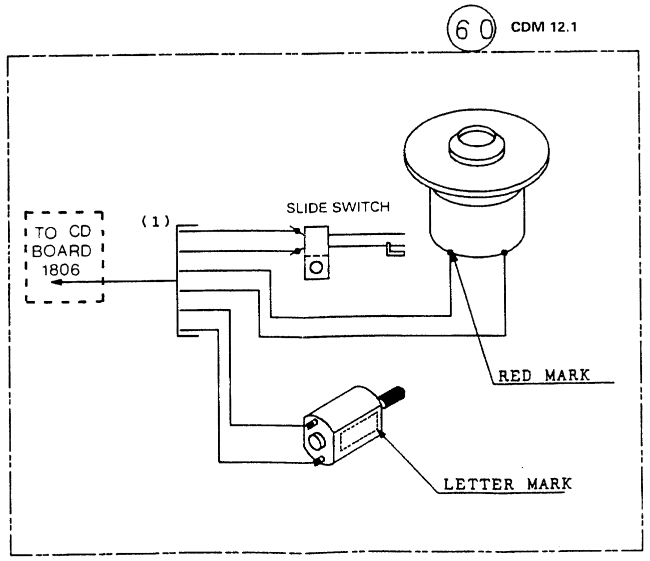

DISC
Turntable motor
Track servo
Focus servo
Slide servo
ALPC
+5V
Laser
Inner switch
pick up unit
slide motor
turntable
Track
Focus
PHOTO DIODE ARRAY
D1
D2
D3
R1
R2
CD - Drive
CDM 12.1
Flex pcb
Focus, Track, D1-D3, R1,R2
CD INTERFACE BOARD see Chapter 10
COMBI BOARD see Chapter 9
7804
6x Inverter
HF- Pre amplifier
PC74HCU04N
HF (Eye Pattern)
1
7860
SAA7345
SIGNAL PROCESSOR CD6
PLL FRONTEND
DIGITAL PLL
MOTOR CONTROL
To Motor Driver 7852
EFM DEMODULATOR
ERROR CORRECTOR
FLAGS
SUBCODE
SRAM
TIMING
16,93MHz OSC.
AUDIO PROCESSOR
RAM ADDRESSER
EBU INTERFACE
MICROPROCESSOR INTERFACE
Q-CHANNEL CRC CHECK
Q-CHANNEL REGISTER
PEAK DETECT
VERSATILE PINS INTERFACE
KILL
SERIAL DATA INTERFACE
RESET
SUPPLY FOR TDA1311
+10V
7871 (TDA1311)
CLK
ws
DATA
SERIAL DATA INTERFACE
D/A
D/A
DAC
CD Left
CD Right
7820
Laser on/off
7850
DIGITAL SERVOPROCESSOR
µP Interface
CLK 16,9MHz
OTD
OTD = Off Track Detection (low active)
6 x Low pass
V
f
A/D Converter
CONTROL
Output Stage
DSIC2 TDA1301T
3 x Low pass
RESET
SLIDE
FOCUS
TRACK
8MHz Osc.
7690
I/O PORT
RAM
TIMING
CPU
I/O PORT
ROM
I/O PORT
µP
TMP879971F
RESET
ACKN
STROBE
DATA
Communication lines with main µP
RESET
ACKN
STROBE
DATA
µP used for other functions too
7801
MOTOR DRIVER
FOCUS +
FOCUS -
TRACK +
TRACK -
3
FOCUS
4
TRACK
6
TDA7073A
7800
MOTOR DRIVER
SLIDE +
SLIDE -
DISC MOTOR +
DISC MOTOR -
2
SLIDE
5
From Signal processor Motor control
TDA7073A
7862
MOTOR DRIVER
TRAY MOTOR
M
CAM MOTOR
M
TRAY MOTOR
POSITION MOTOR
TDA7073A

CDC7 MECHANISM ELECTRONIC

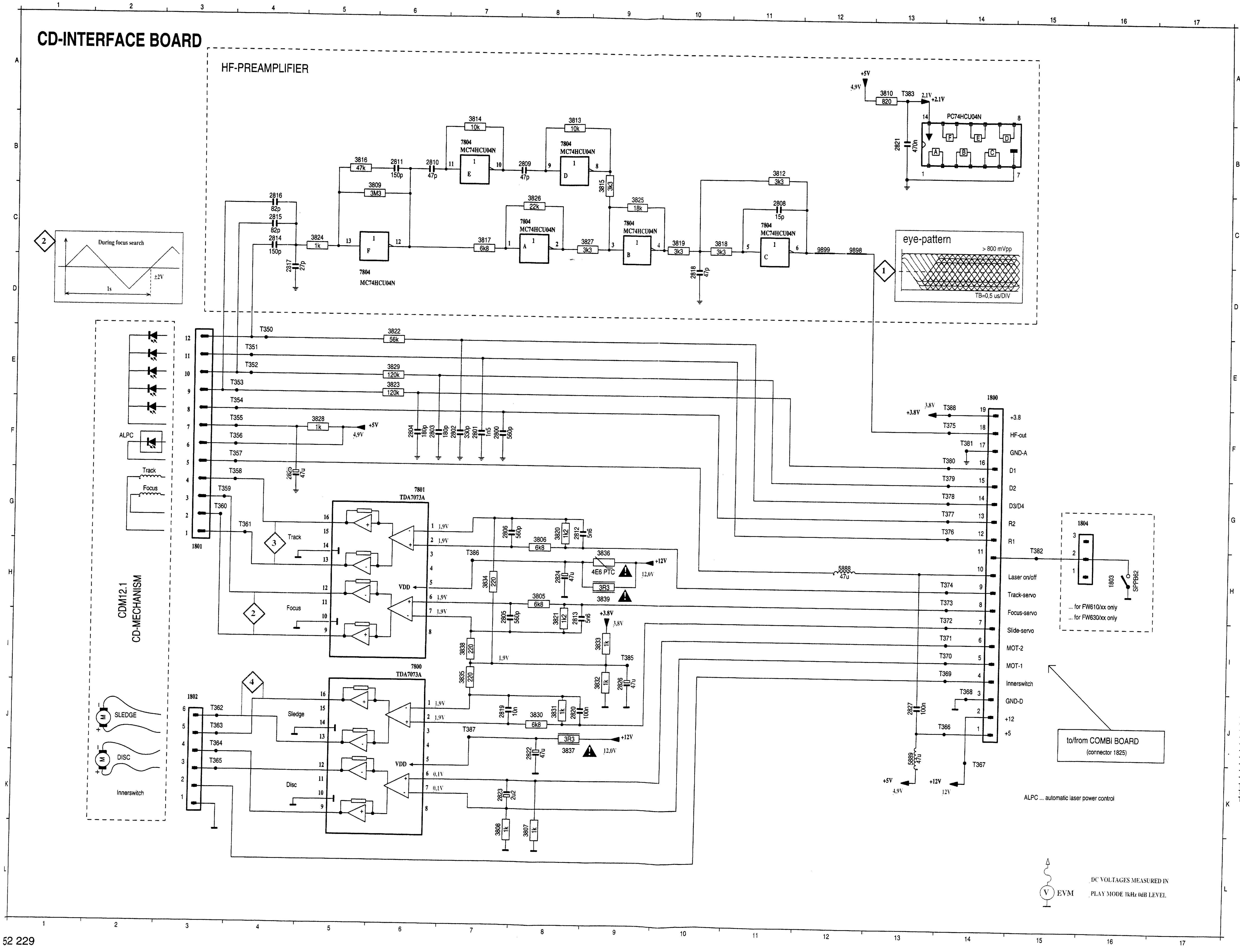

TO CD BOARD
1808
1807
1802
CN2
CN3
CN1
(1)
SW3
82
DISC LOCK
SW1
82
HOME SWITCH
81
85
DISC COUNT
SW2
82
88
87
STORE SWITCH
95
82
PLAY-POS-OVER SWITCH
30 CAM MOTOR
RED MARK
DISC DET. 86
81 EJECT SWITCH
REF. HOLE
3 TRAY MOTOR

NOTE: NUMBERS IN CIRCLES REFERS TO POSITION NUMBERS IN THE CDC EXPLODED VIEW.


CDC MECHANISM ELECTRONICS
CN1
1
From 1802
M
Tray motor (Pos 3)
M
Cam motor (Pos 30)
CN3
1
Home Sw
From 1807
SW1
SW2
SW3 DISC LOCK
CN2
1
STORE
EJECT
DISC DETECT
+5v
+5v
47k
470
Pos 86
+5v
+5v
47k
470
FROM 1808
DISC COUNT
Pos 85
PLAY POS
0V GND
+5V


60 CDM 12.1
TO CD BOARD 1806
(1)
SLIDE SWITCH
RED MARK
LETTER MARK

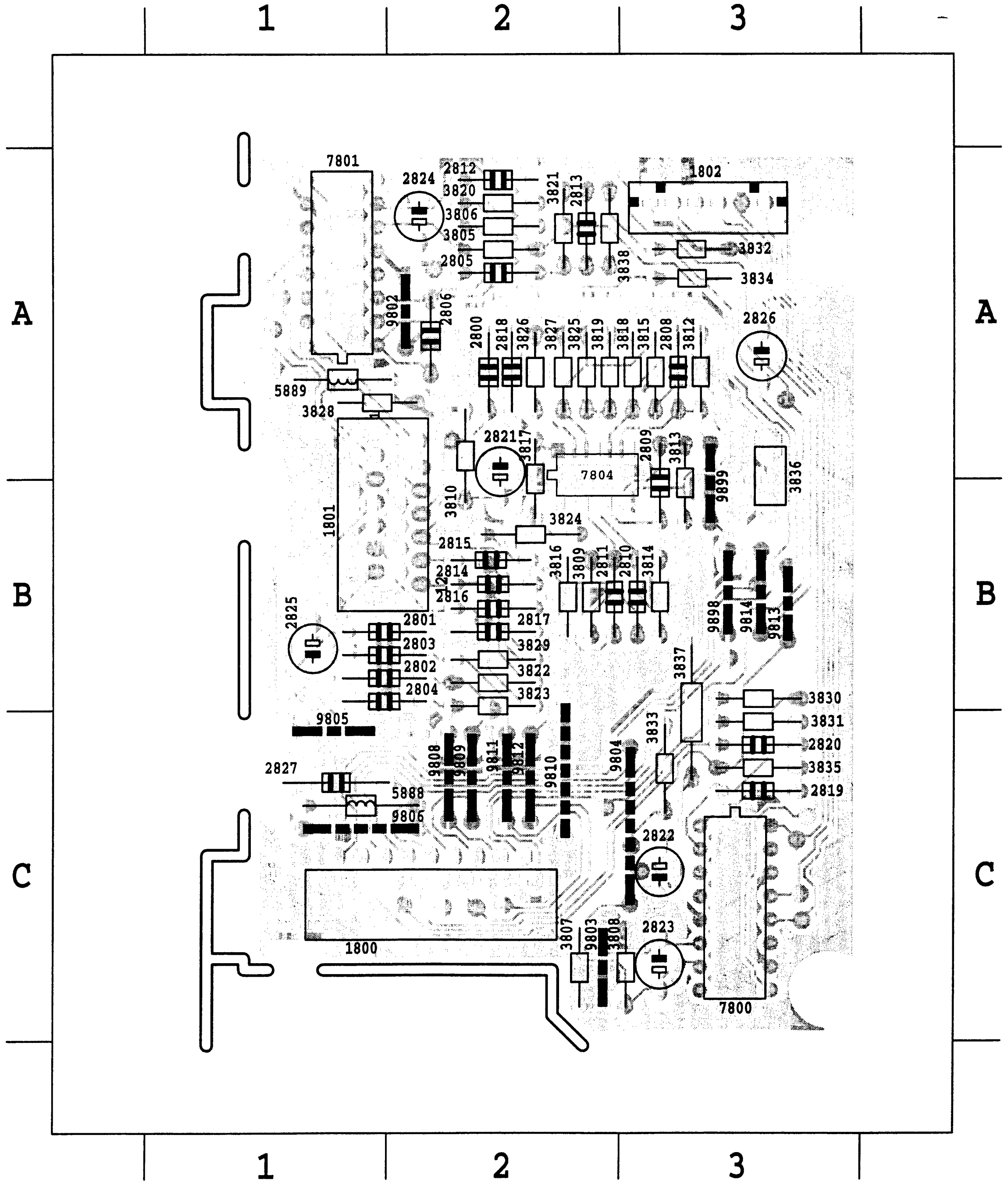
CD-INTERFACE BOARD


HF-PREAMPLIFIER
7804 MC74HCU04N
PC74HCU04N
3810 820
T383
+5V
4,9V
2,1V +2,1V
2821 470n
3814 10k
3813 10k
3816 47k
2811 150p
2810 47p
2809 47p
3809 3M3
3815 3k3
3826 22k
3825 18k
3812 3k3
2808 15p
2816 82p
2815 82p
2814 150p
2817 27p
3824 1k
3817 6k8
3827 3k3
3819 3k3
3818 3k3
2818 47p
9899
9898
eye-pattern
> 800 mVpp
TB=0,5 us/DIV
During focus search
±2V
1s
T350
T351
T352
T353
T354
T355
T356
T357
T358
T359
T360
T361
3822 56k
3829 120k
3823 120k
3828 1k
+5V
4,9V
2804 180p
2803 180p
2802 330p
2801 1n5
2800 560p
2825 47u
1801
ALPC
Track
Focus
CDM12.1
CD-MECHANISM
SLEDGE
DISC
Innerswitch
1802
T362
T363
T364
T365
7801 TDA7073A
7800 TDA7073A
Track
Focus
Sledge
Disc
VDD
1,9V
0,1V
2806 560p
3820 1k2
2812 5n6
3806 6k8
T386
3836 4E6 PTC
+12V
12,0V
2824 47u
3834 220
3839 3R3
3805 6k8
2805 560p
3821 1k2
2813 5n6
+3,8V
3,8V
3833 1k
3838 220
3835 220
T385
3832 1k
2826 47u
2819 10n
3830 6k8
3831 1k
2820 100n
T387
3837 3R3
2822 47u
2823 2u2
3808 1k
3807 1k
5888 47u
5889 47u
2827 100n
1800
T388
T375
T381
T380
T379
T378
T377
T376
T382
T374
T373
T372
T371
T370
T369
T368
T366
T367
+3.8
HF-out
GND-A
D1
D2
D3/D4
R2
R1
Laser on/off
Track-servo
Focus-servo
Slide-servo
MOT-2
MOT-1
Innerswitch
GND-D
+12
+5
+5V
+12V
12V
1804
1803
SPPB62
... for FW610/xx only
... for FW630/xx only
to/from COMBI BOARD
(connector 1825)
ALPC ... automatic laser power control
EVM
DC VOLTAGES MEASURED IN
PLAY MODE 1kHz 0dB LEVEL

1800	E14
1801	H 3
1802	J 3
1803	H16
1804	G15
2800	F 7
2801	F 7
2802	F 7
2803	F 6
2804	F 6
2805	I 7
2806	G 7
2808	C11
2809	B 8
2810	B 6
2811	B 6
2812	G 8
2813	I 8
2814	C 4
2815	C 4
2816	C 4
2817	D 4
2818	D10
2819	J 7
2820	J 8
2821	B13
2822	J 8
2823	K 7
2824	H 8
2825	G 4
2826	I 9
2827	J13
3805	H 8
3806	G 8
3807	L 8
3808	L 7
3809	C 5
3810	A13
3812	B11
3813	B 8
3814	B 7
3815	B 9
3816	B 5
3817	C 7
3818	C10
3819	C10
3820	G 8
3821	I 8
3822	E 6
3823	E 6
3824	C 5
3825	C 9
3826	C 8
3827	C 8
3828	F 5
3829	E 6
3830	J 8
3831	J 8
3832	I 9
3833	I 9
3834	H 7
3835	I 7
3836	H 9
3837	J 8
3838	I 7
3839	H 9
5888	H12
5889	J13
7800	I 6
7801	G 6
7804	C 7
7804	C 9
7804	C11
7804	B 8
7804	B 7
7804	D 5
9898	C12
9899	C12
T350	E 4
T351	E 4
T352	E 4
T353	E 4
T354	F 4
T355	F 4
T356	F 4
T357	F 4
T358	G 4
T359	G 3
T360	G 3
T361	G 4
T362	J 3
T363	J 3
T364	J 3
T365	K 3
T366	J14
T367	K14
T368	I14
T369	I14
T370	I14
T371	I14
T372	H14
T373	H14
T374	H14
T375	F14
T376	G14
T377	G14
T378	G14
T379	F14
T380	F14
T381	F14
T382	G15
T383	A13
T385	I 9
T386	H 7
T387	J 7
T388	E14

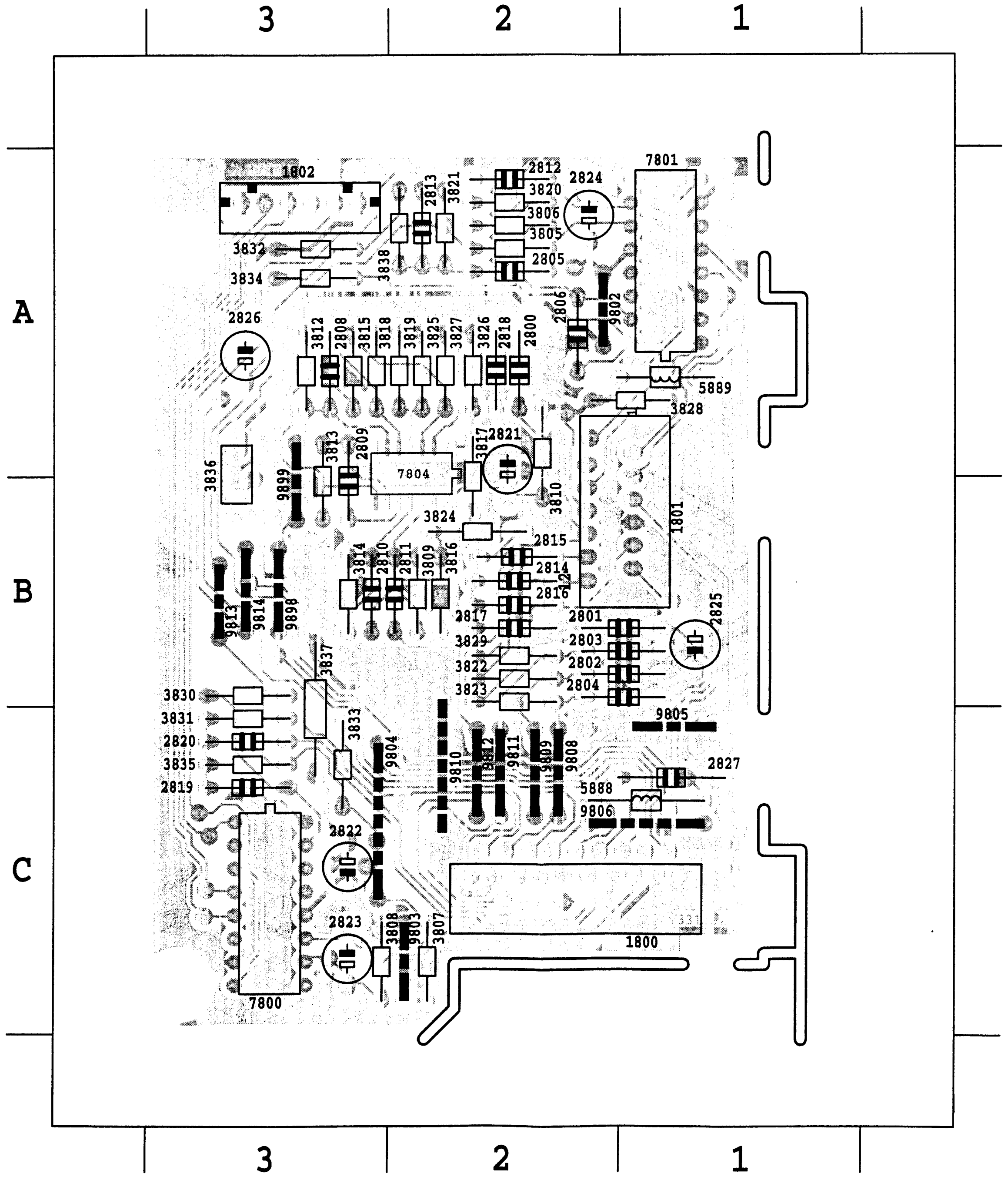
CDC7 IF BOARD Componentside view

1800 C 2
1801 B 2
1802 A 3
2800 A 2
2801 B 1
2802 B 1
2803 B 1
2804 B 1
2805 A 2
2806 A 2
2808 A 3
2809 B 3
2810 B 3
2811 B 2
2812 A 2
2813 A 2
2814 B 2
2815 B 2
2816 B 2
2817 B 2
2818 A 2
2819 C 3
2820 C 3
2821 A 2
2822 C 3
2823 C 3
2824 A 2
2825 B 1
2826 A 3
2827 C 1
3805 A 2
3806 A 2
3807 C 2
3808 C 3
3809 B 2
3810 A 2
3812 A 3
3813 B 3
3814 B 3
3815 A 3
3816 B 2
3817 B 2
3818 A 3
3819 A 2
3820 A 2
3821 A 2
3822 B 2
3823 B 2
3824 B 2
3825 A 2
3826 A 2
3827 A 2
3828 A 1
3829 B 2
3830 B 3
3831 C 3
3832 A 3
3833 C 3
3834 A 3
3835 C 3
3836 A 3
3837 C 3
3838 A 2
5888 C 1
5889 A 1
7800 C 3
7801 A 1
7804 B 2
9802 A 2
9803 C 2
9804 C 3
9805 C 1
9806 C 1
9808 C 2
9809 C 2
9810 C 2
9811 C 2
9812 C 2
9813 B 3
9814 B 3
9898 B 3
9899 B 3

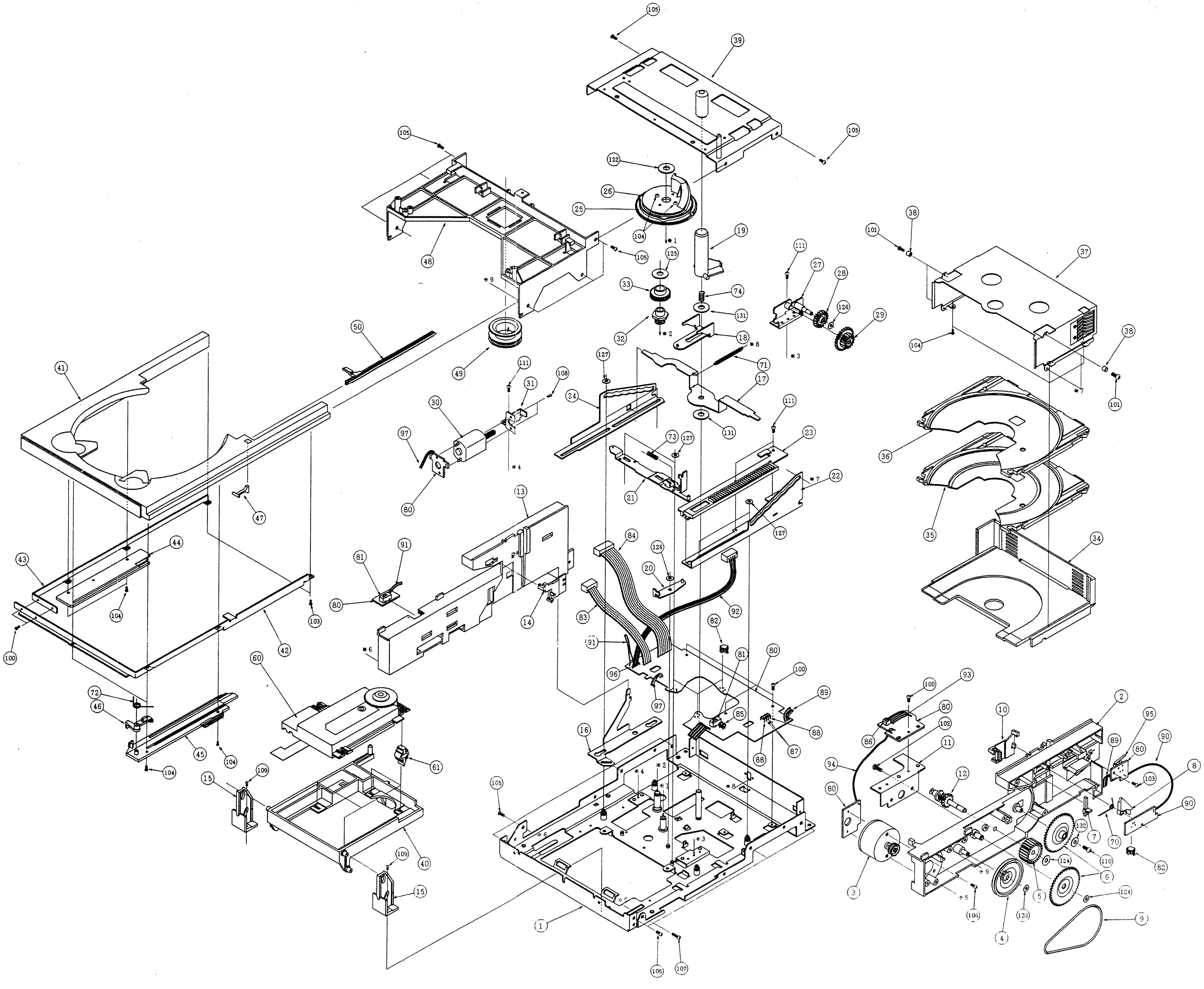

1
2
3
A
B
C
7801
1802
1801
1800
7804
7800
5889
5888
2824
2826
2825
2821
2822
2823
2827
9802
9805
9806
9899
9898
9814
9813

CDC7 IF BOARD Copperside view

1800 C 2
1801 B 2
1802 A 3
2800 A 2
2801 B 1
2802 B 1
2803 B 1
2804 B 1
2805 A 2
2806 A 2
2808 A 3
2809 B 3
2810 B 3
2811 B 2
2812 A 2
2813 A 2
2814 B 2
2815 B 2
2816 B 2
2817 B 2
2818 A 2
2819 C 3
2820 C 3
2821 A 2
2822 C 3
2823 C 3
2824 A 2
2825 B 1
2826 A 3
2827 C 1
3805 A 2
3806 A 2
3807 C 2
3808 C 3
3809 B 2
3810 A 2
3812 A 3
3813 B 3
3814 B 3
3815 A 3
3816 B 2
3817 B 2
3818 A 3
3819 A 2
3820 A 2
3821 A 2
3822 B 2
3823 B 2
3824 B 2
3825 A 2
3826 A 2
3827 A 2
3828 A 1
3829 B 2
3830 B 3
3831 C 3
3832 A 3
3833 C 3
3834 A 3
3835 C 3
3836 A 3
3837 C 3
3838 A 2
5888 C 1
5889 A 1
7800 C 3
7801 A 1
7804 B 2
9802 A 2
9803 C 2
9804 C 3
9805 C 1
9806 C 1
9808 C 2
9809 C 2
9810 C 2
9811 C 2
9812 C 2
9813 B 3
9814 B 3
9898 B 3
9899 B 3


3
2
1
A
B
C
1802
7801
1801
1800
7804
7800
5889
5888
2824
2826
2825
2821
2822
2823
2827
9802
9805
9806
9899
9898
9814
9813

CDC7 Exploded view


105
39
105
105
122
26
25
104
19
48
105
125
33
74
131
32
18
71
17
131
27
28
126
29
111
37
38
101
38
101
104
50
49
41
111
31
108
30
97
80
127
24
73
127
21
23
111
22
127
36
35
34
47
13
84
126
20
92
83
91
81
80
14
43
44
104
42
103
100
82
91
96
81
80
100
89
97
85
88
87
88
60
72
46
45
104
104
61
109
15
40
109
15
16
105
1
105
107
93
100
80
86
102
11
12
94
80
3
106
4
123
5
6
124
124
9
10
2
95
89
80
90
103
8
90
132
7
70
110
82
*1
*2
*3
*4
*5
*6
*7
*8
*9

MECHANICAL PARTSLIST CDC7 CHANGER MODULE

MECHANICAL PARTS

4	4822 528 70861	PULLEY GEAR
5	4822 522 33484	CHANGE GEAR
6	4822 522 33483	GEAR
9	4822 358 10148	BELT
10	4822 404 21346	BRACKET RIGHT
12	4822 522 20457	CLUTCH ASSY
14	4822 404 21347	BRACKET LEFT
16	4822 402 50316	CARRIAGE LEVER
17	4822 402 50315	STOCKER ARM
18	4822 402 61542	LOCK PIN CAM ASSY
20	4822 402 61536	ARM CHANGE ASSY
21	4822 402 50314	LEVER CHANGE ASSY
22	4822 402 61537	STOCKER LEVER RIGHT
23	4822 522 33485	STOCKER GEAR
24	4822 402 61538	STOCKER LEVER LEFT
25	4822 522 33479	CAM GEAR
26	4822 522 33478	CAM UPPER PART
28	4822 522 33482	GEAR
29	4822 522 33481	GEAR
32	4822 522 33476	GEAR
33	4822 522 33477	GEAR CAM WHEEL
34	4822 256 92294	STOCKER
35	4822 466 93397	CARRIAGE DISC 1
36	4822 466 93398	CARRIAGE DISC 2-7
38	4822 532 12282	STOCKER SHAFT
41	4822 444 30489	TRAY
45	4822 466 93396	TRAY PLATE RIGHT
46	4822 402 61539	LOCK ARM
47	4822 402 61541	LATCH LEVER
49	4822 532 61255	CLAMPER ASSY
50	4822 535 93488	SHUTTLE
60	4822 691 30278	CDM12
61	4822 325 50215	SUSPENSION
70	4822 492 42713	SPRING TORSION
71	4822 492 33459	SPRING STOCKER ARM
72	4822 492 42714	SPRING SHUTTLE
73	4822 492 33461	SPRING LEVER CHANGE
74	4822 492 52407	SPRING DISC LOCK PIN
122	4822 532 52591	WASHER
123	4822 532 52588	WASHER
124	4822 532 52589	WASHER
125	4822 530 70124	WASHER
126	4822 532 52586	WASHER
127	4822 532 52587	WASHER
131	4822 532 52465	WASHER

MISCELLANEOUS

3	4822 361 21725	TRAY MOTOR
7	4822 277 11473	LEVER SWITCH
30	4822 361 21726	CAM MOTOR
81	4822 271 30845	SWITCH
82	4822 271 30847	SWITCH
85	4822 130 91369	SENSOR
86	4822 130 91368	SENSOR
87	4822 117 11343	CR16 470E PITCH 5MM
88	4822 117 11344	CR16 47k PITCH 5MM
95	4822 271 30846	SWITCH

ELECTRICAL PARTSLIST CDC7 INTERFACE BOARD

MISCELLANEOUS

1800	4822 267 60412	FLEX PRINT CONNECTOR
1803	4822 276 13503	SWITCH

NTEGRATED CIRCUITS

7800	4822 209 32852	TDA7073A/N2
7801	4822 209 32852	TDA7073A/N2
7804	5322 209 11517	PC74HCU04T

COILS

5888	4822 157 53906	47µH	10%
5889	4822 157 53906	47µH	10%

RESISTORS

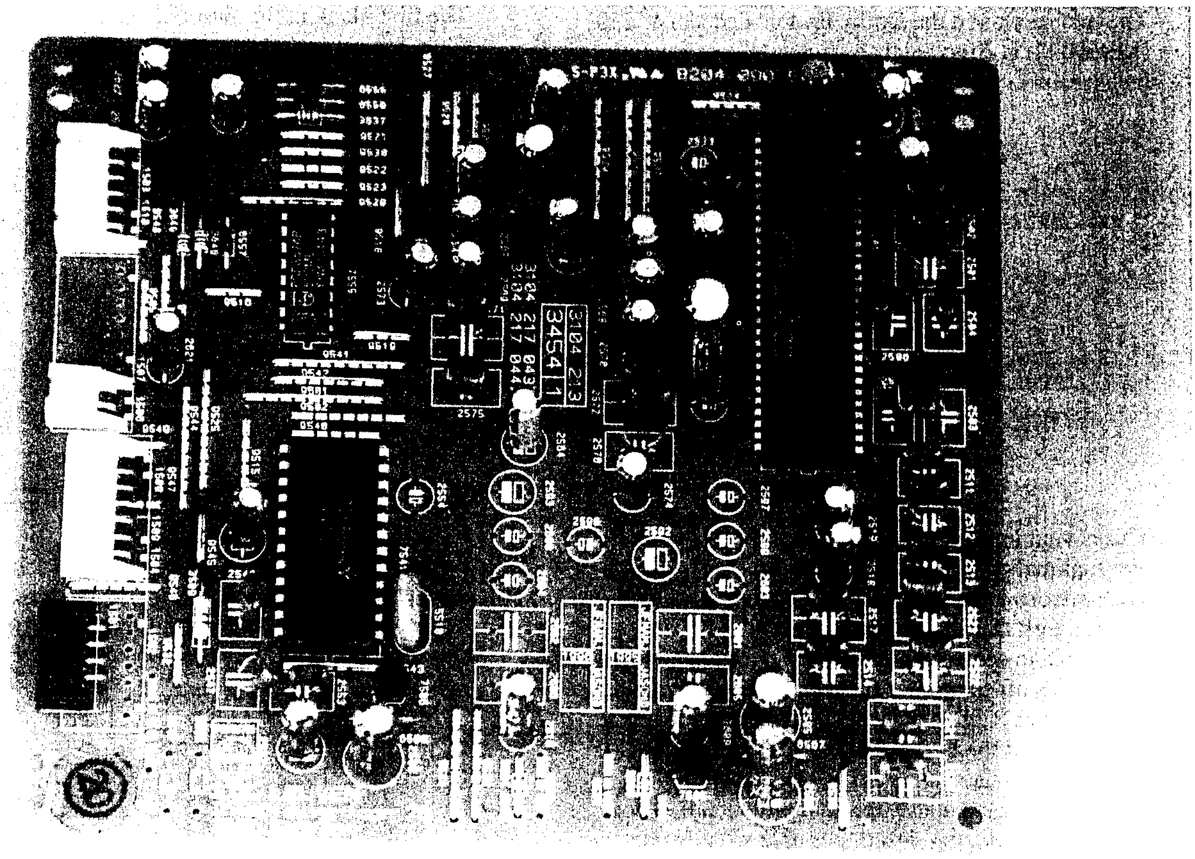
3805	4822 116 52296	6k8	5%	0,5W
3806	4822 116 52296	6k8	5%	0,5W
3807	4822 050 11002	1k	5%	0,2W
3808	4822 050 11002	1k	5%	0,2W
3809	4822 111 50499	3M3	5%	0,2W
3810	4822 116 52231	820R	5%	0,5W
3812	4822 116 52269	3k3	5%	0,5W
3813	4822 116 83864	10k	5%	0,5W
3814	4822 116 83864	10k	5%	0,5W
3815	4822 116 52269	3k3	5%	0,5W
3816	4822 116 52284	47k	5%	0,5W
3817	4822 116 52296	6k8	5%	0,5W
3818	4822 116 52269	3k3	5%	0,5W
3819	4822 116 52269	3k3	5%	0,5W
3820	4822 116 52207	1k2	5%	0,5W
3821	4822 116 52207	1k2	5%	0,5W
3822	4822 116 52291	56k	5%	0,5W
3823	4822 116 52239	120k	5%	0,5W
3824	4822 050 11002	1k	5%	0,2W
3825	4822 116 52251	18k	5%	0,5W
3826	4822 116 52257	22k	5%	0,5W
3827	4822 116 52269	3k3	5%	0,5W
3828	4822 050 11002	1k	5%	0,2W
3829	4822 116 52239	120k	5%	0,5W
3830	4822 116 52296	6k8	5%	0,5W
3831	4822 050 11002	1k	5%	0,2W
3832	4822 050 11002	1k	5%	0,2W
3833	4822 050 11002	1k	5%	0,2W
3834	4822 116 52215	220R	5%	0,16W
3835	4822 116 52215	220R	5%	0,16W
3836	4822 116 40227	PTC	4R6	
3837	4822 052 10338	3R3		NFR25
3838	4822 116 52215	220R	5%	0,16W

CAPACITORS

2800	4822 122 10459	560pF	10%	50V
2801	4822 126 12878	1,5nF	10%	16V
2802	4822 126 12787	330pF	10%	50V
2803	4822 126 10053	180pF	10%	50V
2804	4822 126 10053	180pF	10%	50V
2805	4822 122 10459	560pF	10%	50V
2806	4822 122 10459	560pF	10%	50V
2808	4822 122 10462	15pF	5%	50V
2809	4822 122 33848	47pF	5%	50V

CAPACITORS

2810	4822 122 33848	47pF	5%	50V
2811	4822 122 33849	150pF	10%	50V
2812	4822 126 13098	5,6nF	20%	16V
2813	4822 126 13098	5,6nF	20%	16V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 10319	82pF	5%	50V
2816	4822 122 10319	82pF	5%	50V
2817	4822 122 33192	27pF	5%	50V
2818	4822 122 33848	47pF	5%	50V
2819	4822 121 51387	10nF	20%	16V
2820	4822 126 12882	100nF	20%	50V
2821	4822 124 41407	0,47µF	20%	63V
2822	4822 124 40433	47µF	20%	25V
2823	4822 124 41407	0,47µF	20%	63V
2824	4822 124 40433	47µF	20%	25V
2825	4822 124 40433	47µF	20%	25V
2826	4822 124 40433	47µF	20%	25V
2827	4822 126 12882	100nF	20%	50V



DOLBY PRO-LOGIC UNIT

TABLE OF CONTENTS

Circuit description.. 11-2
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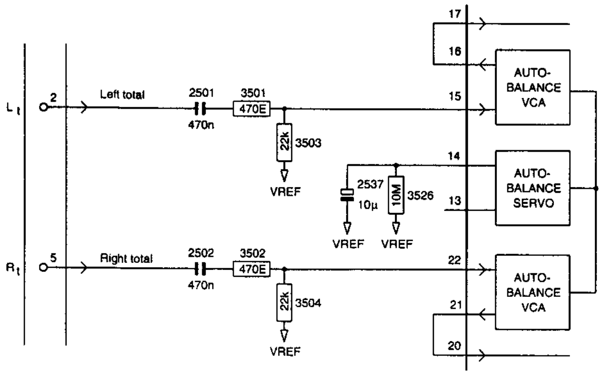
Component layout 11-5
Partslist 11-6

CIRCUIT DESCRIPTION

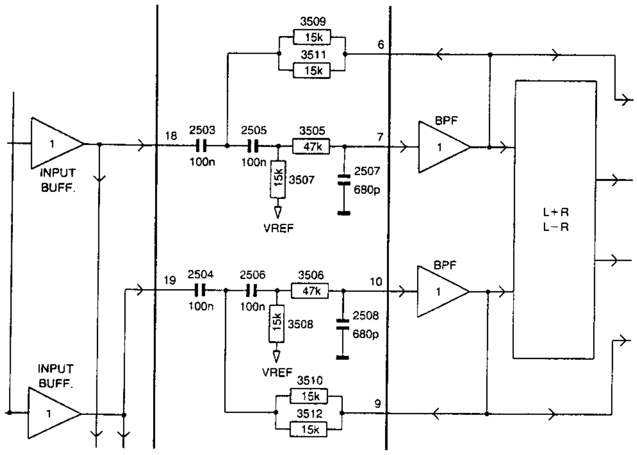
1 - Automatic balance control circuit:

The first section in the Dolby Proloic decoder IC7501 (MC69032) is Auto balance circuit, to correct input balance errors between Lt and Rt. signals.


17
16
15
14
13
22
21
20
Lt
Rt
2
5
Left total
Right total
2501
3501
470E
470n
3503
22k
VREF
2537
10µ
10M
3526
VREF
VREF
2502
3502
470E
470n
3504
22k
VREF
AUTO-BALANCE VCA
AUTO-BALANCE SERVO
AUTO-BALANCE VCA

This is vital to ensure that the following matrix stage givesoptimal results.
The previons generation (Dolby surround) haed an external Left & Right balance control.
To be able to set to correct balance the customer must first switch off the center speaker and select a dialogue. Then Left & Right can be set for minimum dialogue coming out of the Left & Right speakers.
Now through the automatically balance circuit (internally implemented) the center mode off is not needed anymore (but is still possible with this device).
FW670: No center mode OFF feature.

2 - Adaptive matrix stage
(*The heart of the active decoder*)

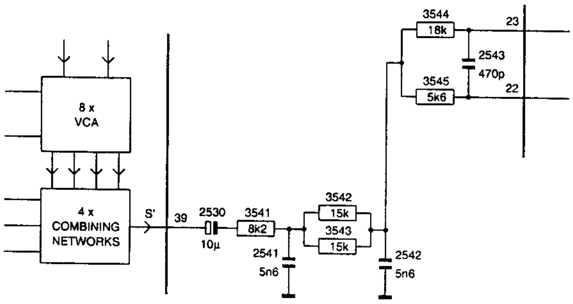

3509
15k
3511
15k
6
18
2503
100n
2505
100n
3505
47k
7
3507
15k
2507
680p
VREF
INPUT BUFF.
BPF
1
L+R
L-R
19
2504
100n
2506
100n
3506
47k
10
3508
15k
2508
680p
VREF
BPF
1
INPUT BUFF.
3510
15k
3512
15k
9

The complex matrix stage splits-up the encoded Lt - Rt signals into Left, Right, Center (L=R) and Surround (L-R) signals
The function of this circuit is to analyse continuously the two channel audio input to determine the direction and relative magnitude of the encoded soundfield (improving directional location).

3 - Filters in surround path .

The first block in the surround path is an ANTI ALIAS filter, to prevent spurious beat product occurring as a result of the sampling process in the time delay stage.

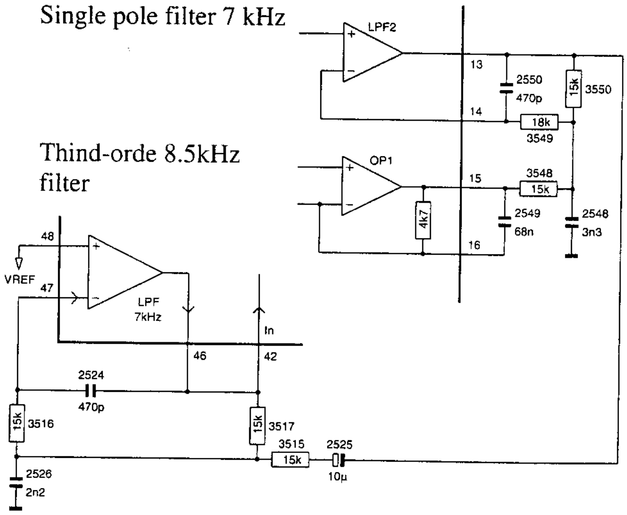
ANTI ALIAS filter,


8 x VCA
4 x COMBINING NETWORKS
S'
39
2530
10µ
3541
8k2
2541
5n6
3542
15k
3543
15k
2542
5n6
3544
18k
23
2543
470p
3545
5k6
22

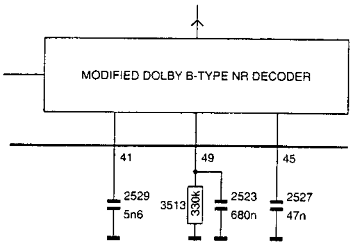
The next filter must have at least a 12 dB per octave slope above the breaking point.
A single pole filter at 7kHz is followed by a third-order filter at 8.5kHz, together giving the proper cut off frequency and steeper roll-off for rejection of BBD clock signals. (**B**ucket - **B**rigade - **D**evices)

Single pole filter 7 kHz

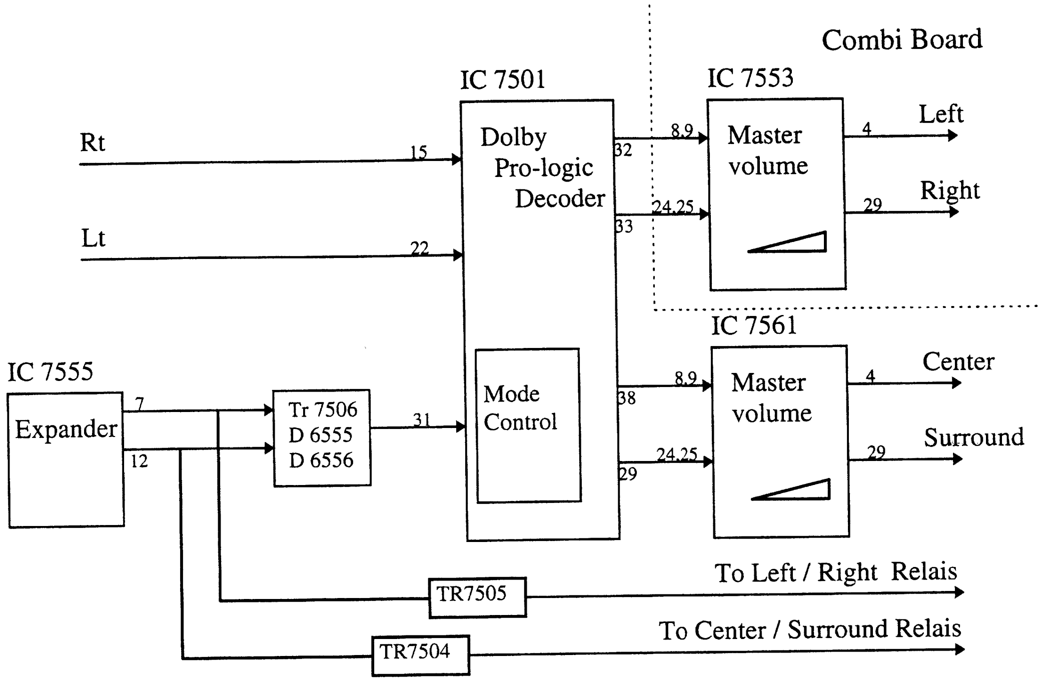
Thind-orde 8.5kHz filter


LPF2
13
2550
470p
3550
15k
14
18k
3549
OP1
15
3548
15k
4k7
2549
68n
2548
3n3
16
48
VREF
47
LPF 7kHz
In
46
42
2524
470p
3516
15k
3517
15k
3515
15k
2525
10µ
2526
2n2

Modified Dolby B type NR (Noise Reduction) decoder is used to reduce the signal to noise ratio in the surround channel and the leakage of high frequency components from the front into the surround channel
Modified Dolby B type NR decoder stage makes correct Dolby B decoding possible


MODIFIED DOLBY B-TYPE NR DECODER
41
49
45
2529
5n6
3513
330k
2523
680n
2527
47n

4 - Mode control circuit



The decoded signals, left,right,center,surround can be switched into the following modes:

Channel mode:

2 channel mode :

original stereo mode (Left and Right output)
- pin7 = high, pin12 = low IC 7555
- pin 31 = low IC 7501

3 channel mode :

No surround speaker available (L,R,C)
The surround information is equally added to the left and right outputs.
-pin 7= low, pin 12 high IC 7555
-pin31 = open input IC 7501 (typical 2...3V)

4 channel mode :

Pro-logic --> all four outputs are used (L,R C,S)
-pin7 = high, pin 12 high IC 7555
-pin31 = high IC 7501

Center mode:

center mode Wide :

Full frequency range in center channel 20Hz.....20kHz. The customer needs a better specified center speaker for this mode (with woofer)

center mode Normal :

-3 dB breakpoint (roll off) at 100Hz, frequency response 100 Hz......20kHz .The customer can place a simple center speaker . To prevent loss of Bass center information these bass < 100Hz is equally added to the left and right full wave speakers.

center mode Phantom :

No center speaker available. To prevent loss of center information these center information (20Hz......20kHz) is equally added to the left and right speakers.

TEST CD DOLBY PROLOGIC TEST DESCRIPTION

- The intention of this description is to explain the most important performance measurements for **DPL** (**D**olby **Pro**-**L**ogic) sets for service.

- Test instruments (recommended) :
    - Dolby Prologic test CD 4822 395 10216
    - AC mv meters (4x) L, C, R, S
    - Oscilloscope (double beam)
    - Distortion meter
    - CD player.

WARNING: **Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection**

STARTING CONDITION :

- Replace the loudspeakers for all four output amplifiers with loud resistors according the output impedance for each amplifier (or use 8 Ω as standard loudresistor).
- Set volume to min. position
- Switch off all features like ASP setting, DBB etc...
- Set "TONE CONTROL" in "FLAT" mode.
- Select the "PRO LOGIC" mode.
- Select "WIDE" mode for Centre channel in sets with this options.
- Set time delay in Surround channel at 20 msec. in sets with variable time delay.
- Dolby Prologic test CD in CD player.

SERVICE TEST DESCRIPTION

Test 1 : *Output and balance setting for all four channels*

Select track 2 :
Adjust L, C, R and S for ≈ 1W output on the loudresistor with master volume. Adjust with L/R balance and Centre/Surround "TRIM" all four channels to equal level (equal meter readings)
Note: 1Watt output corresponds with 2.83V across 8 Ω

$$P = U^2/R \rightarrow U = \sqrt{P \times R} = \sqrt{1 \times 8} = 2{,}83V$$

Test 2 : *Frequency response for Left and Right channel*

Requirement : -3 dB points at ≤ 50 Hz and ≥ 15 kHz
Select track 3:
measure (and note) the overall gain of Left channel across the load resistor.
Select track 4:
measure (and note) the overall gain on Right channel across the load resistor.

Test 3 : *Frequency response for Center channel*

2 possibilitie :
1- Center mode "wide" requirements : -3 dB at ≤ 50 Hz and > 15 kHz (same as L/R requirements)
2- Center mode "normal" requirements : -3 dB point at ± 100 Hz and ≥ 15 kHz (the difference is the roll-off behaviour of the bass frequencies).

Select track 5 :
measure (and note) the overall gain of Center channel across the load resistor in "wide" mode (only in sets with this option) and repeat this measurement in "normal" mode.

Test 4 : *Frequency response for Surround channel*

Surround requirements : -3 dB point at ≤ 100 Hz and ± 7 kHz (6 kHz ... 8 kHz)
The difference is the roll-off behaviour of the high treble frequencies.
Select track 6 :
measure (and note) the overall gain of Surround channel across the loud resistor.

Test 5 : *Modified Dolby B type NR decoding freq. response of the Surround channel*
Requirement : Roll off behaviour at ± 5 kHz related to 100 Hz. In this case use 100 Hz as 0 dB reference gain.
Select track 14:
measure (and note) the overall gain of Surround channel across the load resistor.
Note : The output level on track 14 = -35 dB below the 1W output reference of the Surround channel.

Test 6 :*Total harmonic distortion measurements for Left, Center, Right, Surround channels for 1 Watt output*
Note : If necessary use a special CD test filter 20 Hz ... 20 kHz between the output channel and the distortion meter to prevent spurrious products out of audio waves (> 20 kHz) from to the CD player in test.
Select track 3 :
Measure distortion at 1 kHz across the Left channel.
Output load resistor : requirement THD < 0,3 %
Select track 4 :
Measure distortion at 1 kHz across the Right channel.
Output load resistor : requirement THD < 0,3 %
Select track 5 :
Measure distortion at 1 kHz across the Center channel.
Output load resistor : requirements THD < 0,3 %
Center mode "wide" (if exists) and repeat for center mode "normal"
Select track 6 :
Measure distortion at 1 kHz across the Surround channel load resistor.
Note : time delay setting = 20 msec.
Requirement THD = < 0,5 %

Test 7: *Signal to noise measurements for Left output amplifier*
Select track 3 :
Use 1W output at 1 kHz on the Left channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/Nratio.
Requirements for Left channel ≤ -65 dB

Test 8 : *Signal to noise measurements for Right output amplifier*
Select track 4 :
Use 1W output at 1 kHz on the Right channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Right channel ≤ -65 dB

Test 9 : *Signal to noise measurements for Center output amplifier*
Select track 5 :
Uuse 1W output at 1 kHz on the Center channel (normal or wide mode)
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Center channel (normal or wide mode) ≤ -65 dB

Test 10 : *Signal to noise measurements for Surround output amplifier*
Select track 6 :
Use 1W output at 1 kHz on the Surround channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Surround channel ≤ -55 dB (in all positions between 15 msec ... 30 msec in sets with variable time delay).

Cross-talk (channel separation) between adjacent and opposite channels
2 possibilities :
1- Centre mode "wide" (if exists)(use 1 kHz tone)

Test 11a:
Select track 3 :
For 1 kHz in Left channel and measure the crosstalk in Center, Right, Surround.
Requirement : < -25 dB

Test 12a :
Select track 4 for 1 kHz in Right channel and measure the crosstalk in Surround , Left, Center.
Requirement : < -25 dB

Test 13a :
Select track 5 :
For 1 kHz in Center channel and measure the crosstalk in Left, Right, Surround.
Requirement : < -25 dB

Test 14a :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right.
Requirement : < -25 dB

2- Centre mode "normal" (use 3 kHz or 1 kHz tone)

Test 11b :
Select track 3 :
For 3 kHz in Left channel and measure the crosstalk in Center, Right, Surround
Requirement : < -25 dB

Test 12b :
Select track 4 :
For 3 kHz in Right channel and measure the crosstalk in Surround, Left, Center
Requirement : < -25 dB

Test 13b :
Select track 5 :
For 3 kHz in Centre channel and measure the crosstalk in Left, Right, Surround
Requirement : < -25 dB

Test 14b :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right
Requirement : < -25 dB

Inputs overload test (headroom to visible clipping)

General :
Before starting these tests set Master Volume -15 dB lower to make a new output reference (1W on loudresistors).
Requirement : check on scope for no visible signal clipping or measure THD <1,5 %

Test 15 :
Select track 7 :
Check the Left output signal between 20 Hz ... 20 kHz

Test 16 :
Select track 8 :
Check the Right output signal between 20 Hz ... 20 kHz

Test 17 :
Select track 9 :
Check the Center output signal
CENTER "NORMAL" between 100 Hz ... 20 kHz
CENTER "WIDE" between 20 Hz ... 20 kHz

Test 18 :
Select track 11 :
Check the Surround output signal between 50 Hz ... 7 kHz

Test 19 :*Center Mode Check*
Select Center "Normal" mode
a - Select track 5 at 1 kHz :
Adjust the Center output again with master volume for 1W output as 0 dB reference.
b - Select on track 5 the 100 Hz :
Signal to check the roll-off behaviour at -3 dB on the Center output
c - Select on track 5 the 50 Hz :
Signal and measure on the Left and Right output channels.
The lost 50 Hz signal on the Center output is equally splitted and added to the L and R channels.

Test 20 **:** *Center Mode Check*
Select Center "wide" mode (if exists)
Repeat test 19 a,b and c
The difference is no roll off behaviour at 100 Hz (Center) and no splitted bass (50 Hz signal) added to L and R channel.

Test 21 : *Center Mode Check*

Select Center mode phantom
Select track 5 (20 Hz ... 20 kHz) :
No output signals on the Center output or at least minimum -40 dB related to 1W outputs.
Measure now on the Left and Right output channels : the lost Center signals are equally splitted and added to these left and right channels (- 3 dB)

Test 22 : *3 CH mode control*

Select track 6 (100 Hz ... 7 kHz):
No output signals on the Surround output channel or at least minimum -40 dB related to 1W output.
Measure now at the Left and Right output channels : the lost Surround signals are equally splitted and added to the Left and Right output channels (-3 dB)

Test 23 : *2 CH mode control (stereo)*

Select track 5 :
No output on Centre output channel
Select track 6 :
No output on Surround output channel

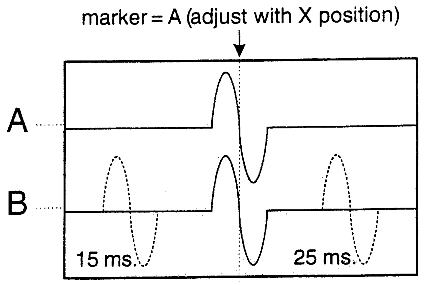
Test 24 : *Time delay control in Surround channel*

- Principle description encoded burst signal spots (see fig. 1)
  1- Tone burst 1 kHz during 1 msec with interval time at 20 msec are given at the same time to the L_t; R_t inputs (in phase 0°)
  2- The next tone burst is given at the same time to the L_t R_t input, but in reverse phase to the R_t input (180°).
  These 2 tone bursts are repeated continuously during 2 minutes.
- Principle description decoded signal spots in Center/Surround channel
  - In case of 20 msec time delay mode the results are shown in fig. 1 in Center and Surround channel.
    The center spots in Center channel can be used as "Marker" spots (trigger signal) → repeated every 40 msec.
    The delayed surround spots occur at the same time as the center spots (markers)
  - When time delay mode is changed to 15 msec the delayed surround spots move to the left with respect to the centre mark spots.
  - When time delay mode is changed to 25 msec or 30 msec the delayed surround spots move to the right with respect to the center spots.
  - In case of no time delay ! (faulty condition) the surround spots fall just between 2 center markers spots (20 msec)
- **How to check with a double beam scope**

WARNING: Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection

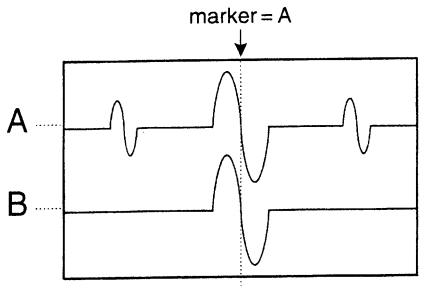
- Select Pro Logic mode "wide" or "normal" (phantom in case of no Center output.)
- Select 20 msec time delay in Surround channel.
- Adjust scope at 5 msec/division and trigger at A input
- Connect input A to Center channel (or L or R in case of phantom mode)
- Connect input B to Surround channel
- Adjust trigger level and the X position to set pulse A in the middle of the scope . see fig.2 (if L or R used in phantom mode choose the largest (amplitude) pulse. see fig 3

Select track 24:
Pulse A = 20 msec marker
Pulse B = delayed surround signal pulse



20 msec. time delay

Fig. 2



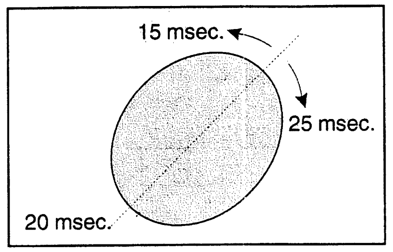
20 msec. in case of phantom mode

Fig. 3

Change time delay to 15 msec (only in versions with variable delay).
he surround pulse in channel B moves to the left with respect to side from center marker (channel A) position.
Change time delay to 25 or 30 msec (versions with variable delay).
The surround pulse in channel B moves to the right with respect to center marker (channel A) position.

Time delay with track 6

Alternative methode :
The functional operation of the time delay can be made visible with a lisajous figure, with an single beam scope.
Connect X-direction on Surround output
Connect Y-direction on Left or Right output/input.
Note : be careful and use only 1 ground connected to scope.
Select track 6 (surround test) :
Make the lisajous figure visible on the scope (amplitude adjust) see fig. 4



Lisajous out of phase
Time delay = OK

Fig. 4

Note : in sets with variable time delay the ellipse of the lisajous figure must be always open. Changing the time delay changes the direction of the circle accordingly.

Tone burst to check time delay in Surround channel

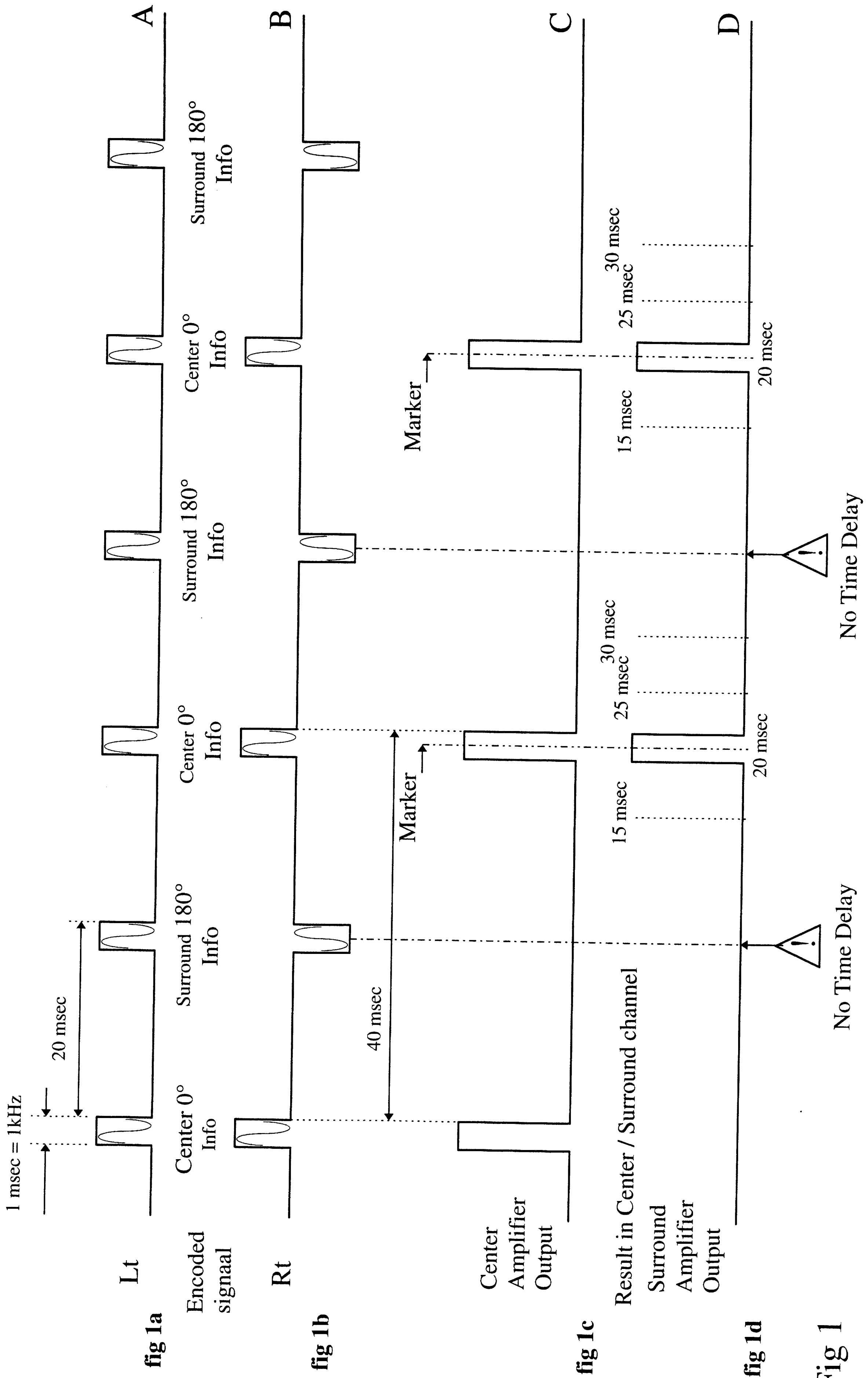
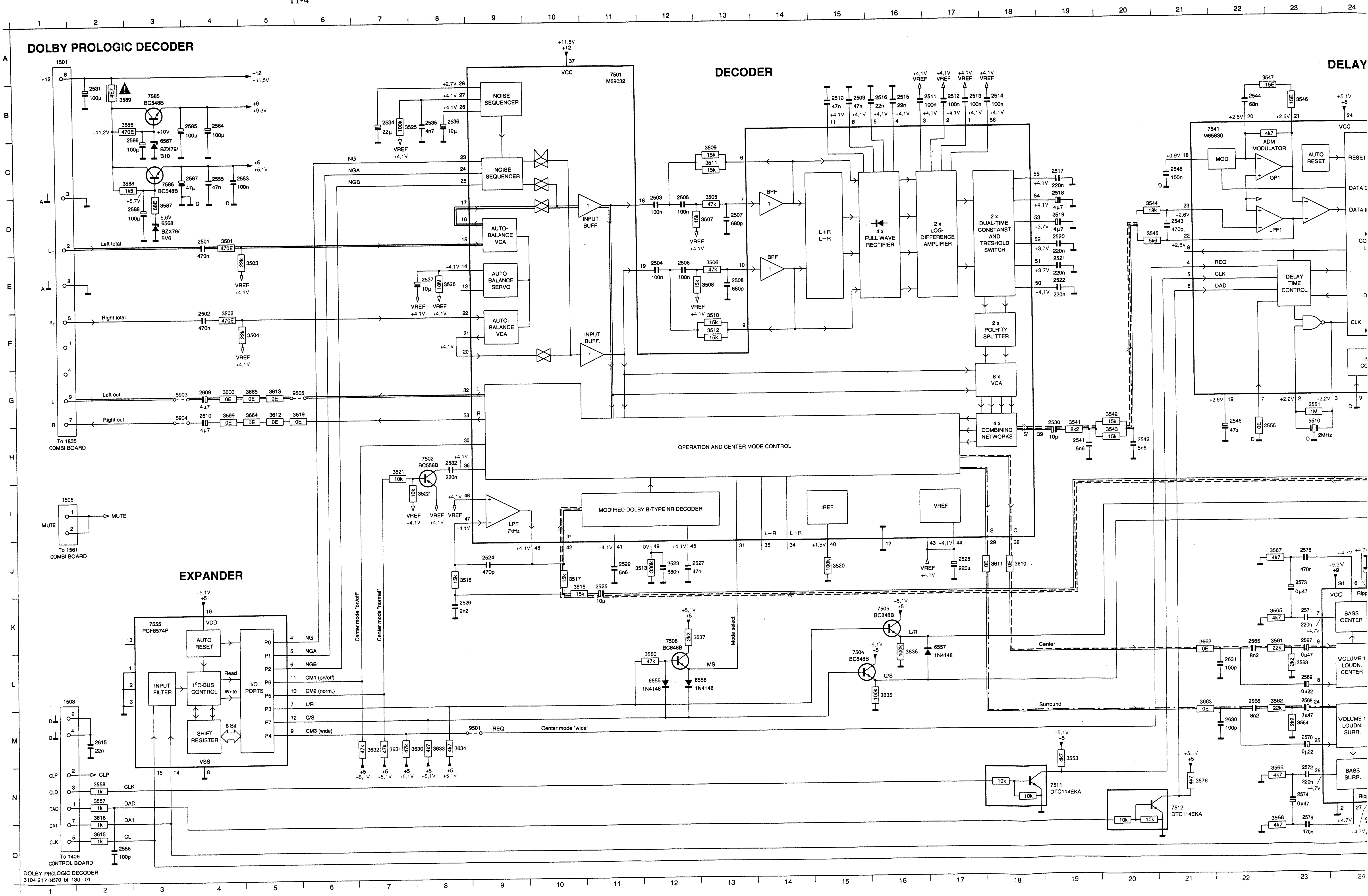
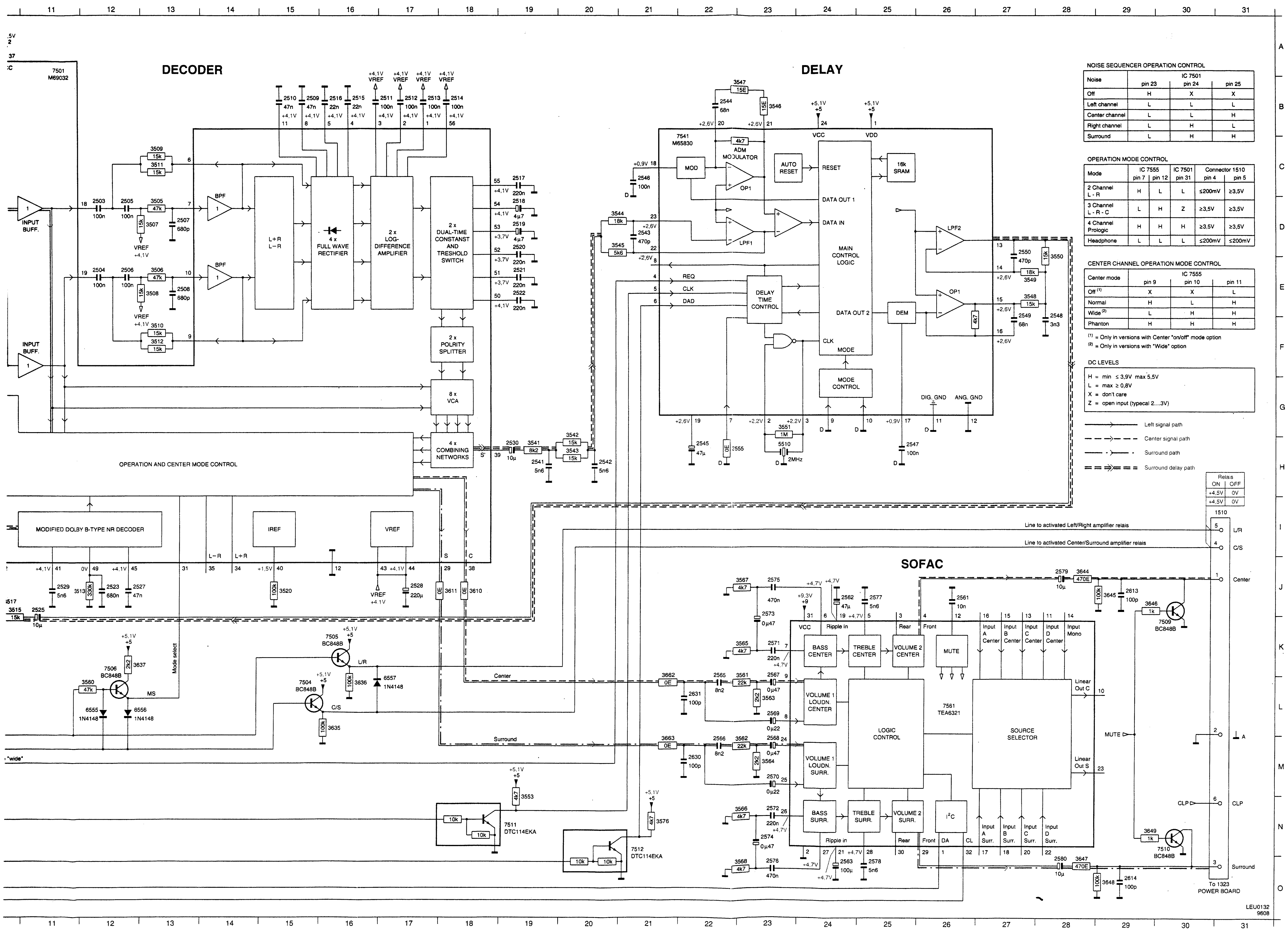


fig 1a
Lt
Encoded signaal
fig 1b
Rt
Center Amplifier Output
fig 1c
Result in Center / Surround channel
Surround Amplifier Output
fig 1d
1 msec = 1kHz
20 msec
40 msec
Center 0° Info
Surround 180° Info
Center 0° Info
Surround 180° Info
Center 0° Info
Surround 180° Info
Marker
Marker
15 msec
20 msec
25 msec
30 msec
15 msec
20 msec
25 msec
30 msec
No Time Delay
No Time Delay
A
B
C
D

Fig 1


DOLBY PROLOGIC DECODER
DECODER
EXPANDER
DELAY
1501
To 1835
COMBI BOARD
1506
MUTE
To 1561
COMBI BOARD
1508
To 1408
CONTROL BOARD
7585
BC548B
7586
BC548B
6567
BZX79/
B10
6568
BZX79/
5V6
+12
+11,5V
+9
+9,3V
+5
+5,1V
Left total
Right total
Left out
Right out
7501
M69032
VCC
NOISE
SEQUENCER
AUTO-
BALANCE
VCA
AUTO-
BALANCE
SERVO
INPUT
BUFF.
BPF
L+R
L−R
4 x
FULL WAVE
RECTIFIER
2 x
LOG-
DIFFERENCE
AMPLIFIER
2 x
DUAL-TIME
CONSTANT
AND
TRESHOLD
SWITCH
2 x
POLRITY
SPLITTER
8 x
VCA
4 x
COMBINING
NETWORKS
OPERATION AND CENTER MODE CONTROL
MODIFIED DOLBY B-TYPE NR DECODER
IREF
VREF
LPF
7kHz
7502
BC558B
7555
PCF8574P
VDD
AUTO
RESET
I²C-BUS
CONTROL
INPUT
FILTER
SHIFT
REGISTER
8 Bit
I/O
PORTS
Read
Write
VSS
NG
NGA
NGB
CM1 (on/off)
CM2 (norm.)
L/R
C/S
CM3 (wide)
REQ
Center mode "wide"
Center mode "on/off"
Center mode "normal"
Mode select
7505
BC848B
7506
BC848B
7504
BC848B
6555
1N4148
6556
1N4148
6557
1N4148
MS
Center
Surround
7511
DTC114EKA
7512
DTC114EKA
7541
M65830
MOD
ADM
MODULATOR
OP1
LPF1
AUTO
RESET
RESET
DATA
REQ
CLK
DAD
DELAY
TIME
CONTROL
2MHz
BASS
CENTER
VOLUME
LOUDN.
CENTER
VOLUME
LOUDN.
SURR.
BASS
SURR.
CLP
CLD
DAD
DA1
CLK
CL
DOLBY PROLOGIC DECODER
3104 217 04370 bl. 130 - 01


DECODER
DELAY
SOFAC
7501
M69032
INPUT BUFF.
BPF
L+R
L−R
4 x FULL WAVE RECTIFIER
2 x LOG-DIFFERENCE AMPLIFIER
2 x DUAL-TIME CONSTANST AND TRESHOLD SWITCH
2 x POLRITY SPLITTER
8 x VCA
4 x COMBINING NETWORKS
OPERATION AND CENTER MODE CONTROL
MODIFIED DOLBY B-TYPE NR DECODER
IREF
VREF
7541
M65830
MOD
ADM MODULATOR
OP1
LPF1
AUTO RESET
RESET
16k SRAM
DATA OUT 1
DATA IN
MAIN CONTROL LOGIC
DELAY TIME CONTROL
REQ
CLK
DAD
DATA OUT 2
DEM
LPF2
MODE CONTROL
DIG. GND
ANG. GND
VCC
VDD
5510
2MHz
7505 BC848B
7506 BC848B
7504 BC848B
6555 1N4148
6556 1N4148
6557 1N4148
Mode select
MS
L/R
C/S
Center
Surround
"wide"
7511 DTC114EKA
7512 DTC114EKA
7561 TEA6321
BASS CENTER
TREBLE CENTER
VOLUME 2 CENTER
MUTE
VOLUME 1 LOUDN. CENTER
LOGIC CONTROL
SOURCE SELECTOR
VOLUME 1 LOUDN. SURR.
BASS SURR.
TREBLE SURR.
VOLUME 2 SURR.
I²C
Ripple in
Rear
Front
Input A Center
Input B Center
Input C Center
Input D Center
Input Mono
Input A Surr.
Input B Surr.
Input C Surr.
Input D Surr.
Linear Out C
Linear Out S
7509 BC848B
7510 BC848B
MUTE
CLP
1510
L/R
C/S
Center
Surround
Line to activated Left/Right amplifier relais
Line to activated Center/Surround amplifier relais
To 1323 POWER BOARD
LEU0132
9608

NOISE SEQUENCER OPERATION CONTROL

Noise	IC 7501		
	pin 23	pin 24	pin 25
Off	H	X	X
Left channel	L	L	L
Center channel	L	L	H
Right channel	L	H	L
Surround	L	H	H

OPERATION MODE CONTROL

Mode	IC 7555		IC 7501	Connector 1510	
	pin 7	pin 12	pin 31	pin 4	pin 5
2 Channel L - R	H	L	L	≤200mV	≥3,5V
3 Channel L - R - C	L	H	Z	≥3,5V	≥3,5V
4 Channel Prologic	H	H	H	≥3,5V	≥3,5V
Headphone	L	L	L	≤200mV	≤200mV

CENTER CHANNEL OPERATION MODE CONTROL

Center mode	IC 7555		
	pin 9	pin 10	pin 11
Off (1)	X	X	L
Normal	H	L	H
Wide (2)	L	H	H
Phanton	H	H	H

(1) = Only in versions with Center "on/off" mode option

(2) = Only in versions with "Wide" option

DC LEVELS

H = min ≤ 3,9V max 5,5V
L = max ≥ 0,8V
X = don't care
Z = open input (typecal 2....3V)

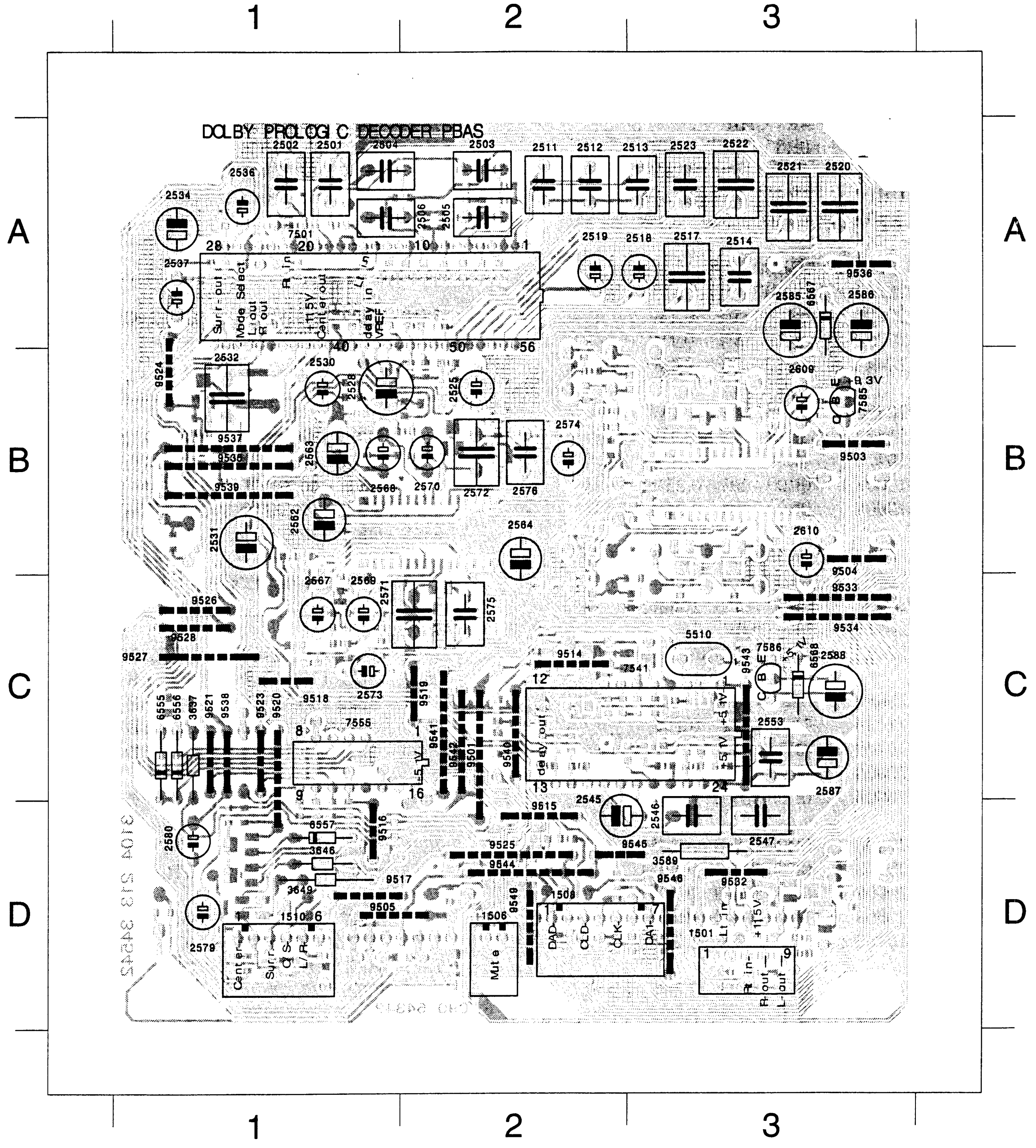
——>—— Left signal path
— — >— — Center signal path
——- >—— - Surround path
== == ⇒== == Surround delay path

Relais	
ON	OFF
+4,5V	0V
+4,5V	0V

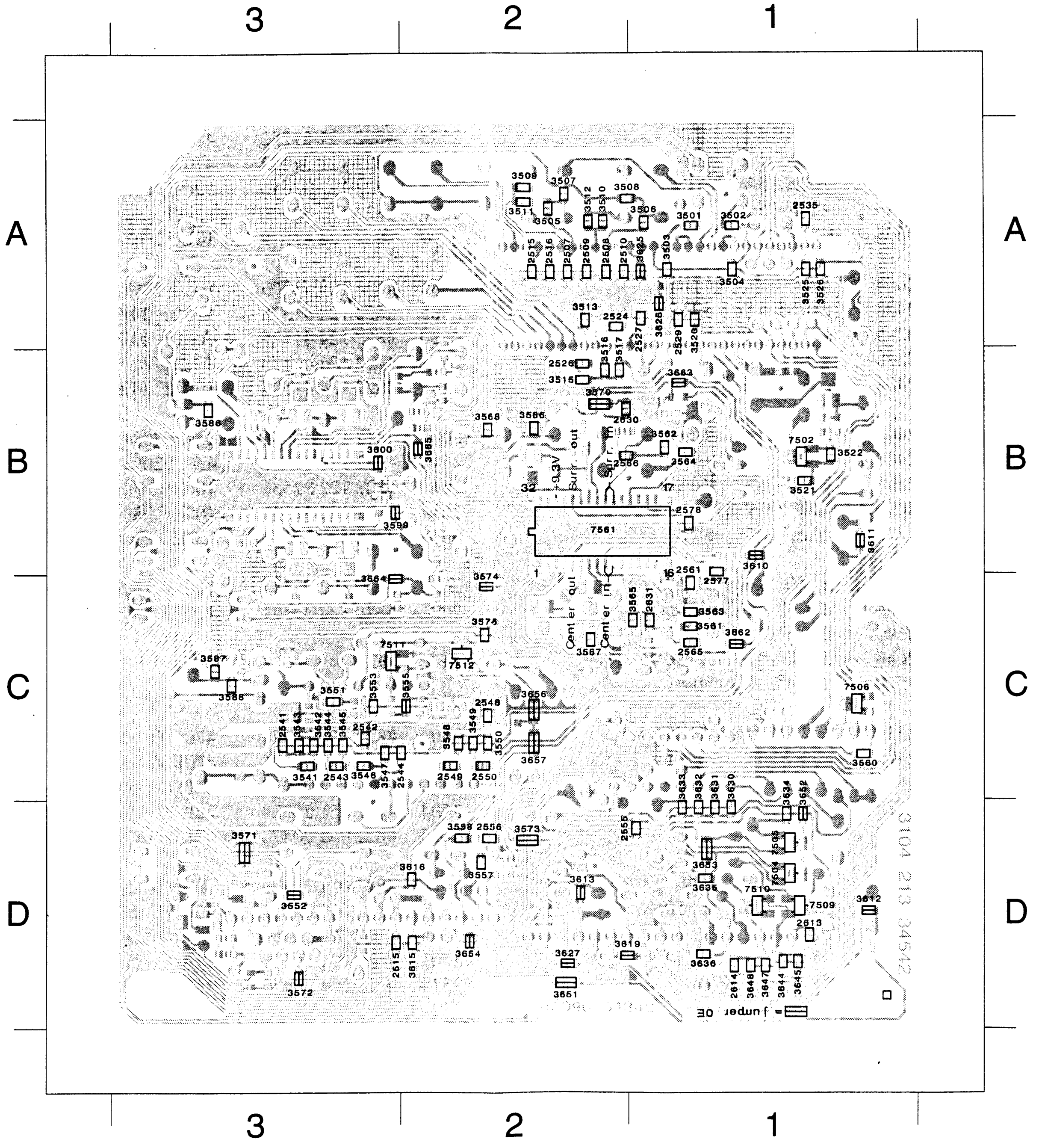
1501	A1	3561	L22
1506	I1	3562	M22
1508	L1	3563	L23
1510	I30	3564	M23
2501	D4	3565	K22
2502	F4	3566	N22
2503	D12	3567	J22
2504	E12	3568	O22
2505	D12	3576	N21
2506	E12	3586	B2
2507	D13	3587	D3
2508	E13	3588	C2
2509	B15	3589	B2
2510	B15	3599	G4
2511	B17	3600	G4
2512	B17	3610	J18
2513	B17	3611	J18
2514	B18	3612	G5
2515	B16	3613	G5
2516	B16	3615	O2
2517	C19	3616	N2
2518	D19	3619	G5
2519	D19	3630	M7
2520	D19	3631	M7
2521	E19	3632	M7
2522	E19	3633	M8
2523	J12	3634	M8
2524	J9	3635	L16
2525	J11	3636	L16
2526	K8	3637	K12
2527	J12	3644	J28
2528	J17	3645	J29
2529	J11	3646	J29
2530	H19	3647	O28
2531	B2	3648	O29
2532	H8	3649	N29
2534	B7	3662	L21
2535	B8	3663	M21
2536	B8	3664	G5
2537	E8	3665	G5
2541	H19	5510	H23
2542	H20	5903	G3
2543	D21	5904	G3
2544	B22	6555	L12
2545	H22	6556	L12
2546	C21	6557	L17
2547	H25	6567	C3
2548	F28	6568	D3
2549	F27	7501	A11
2550	D27	7502	H8
2553	C4	7504	L15
2555	C4	7505	K16
2556	O2	7506	K12
2561	J26	7509	K30
2562	J24	7510	N30
2563	O24	7511	N19
2564	B4	7512	N21
2565	L22	7541	C21
2566	M22	7555	K3
2567	L23	7561	L26
2568	M23	7585	B3
2569	L23	7586	C3
2570	M23	9501	M8
2571	K23	9505	G5
2572	N23		
2573	K23		
2574	N23		
2575	J23		
2576	O23		
2577	J25		
2578	O25		
2579	J28		
2580	O28		
2585	B4		
2586	C3		
2587	C4		
2588	D3		
2609	G4		
2610	G4		
2613	J29		
2614	O29		
2615	M2		
2630	M22		
2631	L22		
3501	D4		
3502	F4		
3503	E5		
3504	F5		
3505	D13		
3506	E13		
3507	D13		
3508	E13		
3509	C13		
3510	F13		
3511	C13		
3512	F13		
3513	J11		
3515	J10		
3516	J8		
3517	J10		
3520	J15		
3521	H7		
3522	I8		
3525	B7		
3526	E8		
3541	H19		
3542	H20		
3543	H20		
3544	D20		
3545	D20		
3546	B23		
3547	B22		
3548	E27		
3549	E27		
3550	E28		
3551	G23		
3553	N19		
3555	H22		
3557	N2		
3558	N2		
3560	L12		

Dolby Prologic Board

1501 D 3	2512 A 2	2528 B 1	2562 B 1	2575 C 2	3637 C 1	7555 C 1	9518 C 1	9533 C 3	9544 D 2
1506 D 2	2513 A 3	2530 B 1	2563 B 1	2576 B 2	3646 D 1	7585 B 3	9519 C 2	9534 C 3	9545 D 2
1508 D 2	2514 A 3	2531 B 1	2564 B 2	2579 D 1	3649 D 1	7586 C 3	9520 C 1	9535 B 1	9546 D 3
1510 D 1	2517 A 3	2532 B 1	2567 C 1	2580 D 1	5510 C 3	9501 C 2	9521 C 1	9536 A 3	9549 D 2
2501 A 1	2518 A 3	2534 A 1	2568 B 1	2585 A 3	6555 C 1	9503 B 3	9523 C 1	9537 B 1	
2502 A 1	2519 A 2	2536 A 1	2569 C 1	2586 A 3	6556 C 1	9504 B 3	9524 B 1	9538 C 1	
2503 A 2	2520 A 3	2537 A 1	2570 B 2	2587 C 3	6557 D 1	9505 D 1	9525 D 2	9539 B 1	
2504 A 1	2521 A 3	2545 D 2	2571 C 2	2588 C 3	6567 A 3	9514 C 2	9526 C 1	9540 C 2	
2505 A 2	2522 A 3	2546 D 3	2572 B 2	2609 B 3	6568 C 3	9515 D 2	9527 C 1	9541 C 2	
2506 A 1	2523 A 3	2547 D 3	2573 C 1	2610 B 3	7501 A 1	9516 D 1	9528 C 1	9542 C 2	
2511 A 2	2525 B 2	2553 C 3	2574 B 2	3589 D 3	7541 C 3	9517 D 1	9532 D 3	9543 C 3	


1
2
3
A
B
C
D
DOLBY PROLOGIC DECODER PBAS
7501
7555
7541
5510
1501
1506
1508
1510
Mute
3104 213 3454

2524 A 2	2556 D 2	3503 A 1	3517 B 2	3548 C 2	3564 B 1	3588 C 3	3630 D 1	3653 D 1	7510 D 1
2526 B 2	2561 C 1	3504 A 1	3520 A 1	3549 C 2	3565 C 1	3599 B 3	3631 D 1	3654 D 2	7511 C 3
2527 A 1	2565 C 1	3505 A 2	3521 B 1	3550 C 2	3566 B 2	3600 B 3	3632 D 1	3656 C 2	7512 C 2
2529 A 1	2566 B 2	3506 A 1	3522 B 1	3551 C 3	3567 C 2	3610 B 1	3633 D 1	3657 C 2	7561 B 2
2535 A 1	2577 B 1	3507 A 2	3525 A 1	3552 D 3	3568 B 2	3611 B 1	3634 D 1	3662 C 1	
2541 C 3	2578 B 1	3508 A 2	3526 A 1	3553 C 3	3570 B 2	3612 D 1	3635 D 1	3663 B 1	
2542 C 3	2613 D 1	3509 A 2	3541 C 3	3555 C 2	3571 D 3	3613 D 2	3636 D 1	3664 C 3	


3
2
1
A
B
C
D
7561
7502
7510
7511
7512
7509
jumper
3104 213 3454

ELECTRICAL PARTSLIST DOLBY PROLOGIC DECODER

CAPACITORS

2501	4822 121 51252	470NF 5% 63V
2502	4822 121 51252	470NF 5% 63V
2503	5322 121 42386	100NF 5% 63V
2504	5322 121 42386	100NF 5% 63V
2505	5322 121 42386	100NF 5% 63V
2506	5322 121 42386	100NF 5% 63V
2507	4822 122 32535	680PF10%X7R 63V
2508	4822 122 32535	680PF10%X7R 63V
2509	4822 126 12944	47NF10%X7R 50V
2510	4822 126 12944	47NF10%X7R 50V
2511	5322 121 42386	100NF 5% 63V
2512	5322 121 42386	100NF 5% 63V
2513	5322 121 42386	100NF 5% 63V
2514	5322 121 42386	100NF 5% 63V
2515	5322 122 32654	22NF10%X7R 63V
2516	5322 122 32654	22NF10%X7R 63V
2517	4822 121 42408	220NF 5% 63V
2518	4822 124 40246	4,7UF20% 63V
2519	4822 124 40246	4,7UF20% 63V
2520	4822 121 42408	220NF 5% 63V
2521	4822 121 42408	220NF 5% 63V
2522	4822 121 42408	220NF 5% 63V
2523	5322 121 42498	680NF 5% 63V
2524	5322 122 34099	470PF10%X7R 63V
2525	4822 124 41579	10UF 20% 50V
2526	4822 122 33175	2,2NF 20% X7R 50V
2527	4822 126 12944	47NF10%X7R 50V
2528	4822 124 40196	220UF20% 16V
2529	4822 122 32646	5,6NF10%X7R 50V
2530	4822 124 41579	10UF 20% 50V
2531	4822 124 41525	100UF 20% 25V
2532	4822 121 42408	220NF 5% 63V
2534	4822 124 41596	22UF20% 50V
2535	5322 126 10223	4,7NF10%X7R 63V
2536	4822 124 41579	10UF 20% 50V
2537	4822 124 41579	10UF 20% 50V
2541	4822 122 32646	5,6NF10%X7R 50V
2542	4822 122 32646	5,6NF10%X7R 50V
2543	5322 122 34099	470PF10%X7R 63V
2544	4822 126 13828	68NF 16V X7R
2545	4822 124 40433	47UF20% 25V
2546	5322 121 42386	100NF 5% 63V
2547	5322 121 42386	100NF 5% 63V
2548	4822 122 33891	3,3NF10%X7R 63V
2549	4822 126 13828	68NF 16V X7R
2550	5322 122 34099	470PF10%X7R 63V
2553	5322 121 42386	100NF 5% 63V
2555	4822 126 12944	47NF10%X7R 50V
2556	5322 122 32531	100PF 5%NP0 50V
2561	4822 122 33177	10NF 20% X7R 50V
2562	4822 124 40433	47UF20% 25V
2563	4822 124 41584	100UF 20% 10V
2564	4822 124 41584	100UF 20% 10V

CAPACITORS

2565	4822 122 33336	8,2NF10%X7R 50V
2566	4822 122 33336	8,2NF10%X7R 50V
2567	4822 124 41407	0,47UF 20% 63V
2568	4822 124 41407	0,47UF 20% 63V
2569	4822 124 40746	0,22UF20% 63V
2570	4822 124 40746	0,22UF20% 63V
2571	4822 121 42408	220NF 5% 63V
2572	4822 121 42408	220NF 5% 63V
2573	4822 124 41407	0,47UF 20% 63V
2574	4822 124 41407	0,47UF 20% 63V
2575	4822 121 51252	470NF 5% 63V
2576	4822 121 51252	470NF 5% 63V
2577	4822 122 32646	5,6NF10%X7R 50V
2578	4822 122 32646	5,6NF10%X7R 50V
2579	4822 124 41579	10UF 20% 50V
2580	4822 124 41579	10UF 20% 50V
2585	4822 124 41525	100UF 20% 25V
2586	4822 124 41525	100UF 20% 25V
2587	4822 124 40433	47UF20% 25V
2588	4822 124 41525	100UF 20% 25V
2609	4822 124 40246	4,7UF20% 63V
2610	4822 124 40246	4,7UF20% 63V
2613	5322 122 32531	100PF 5%NP0 50V
2614	5322 122 32531	100PF 5%NP0 50V
2615	5322 122 32654	22NF10%X7R 63V
2630	5322 122 32531	100PF 5%NP0 50V
2631	5322 122 32531	100PF 5%NP0 50V

RESISTORS

3501	4822 051 20471	470R00 5% 0,1W
3502	4822 051 20471	470R00 5% 0,1W
3503	4822 051 20223	22K00 5% 0,1W
3504	4822 051 20223	22K00 5% 0,1W
3505	4822 051 20473	47K00 5% 0,1W
3506	4822 051 20473	47K00 5% 0,1W
3507	4822 051 20153	15K00 5% 0,1W
3508	4822 051 20153	15K00 5% 0,1W
3509	4822 051 20153	15K00 5% 0,1W
3510	4822 051 20153	15K00 5% 0,1W
3511	4822 051 20153	15K00 5% 0,1W
3512	4822 051 20153	15K00 5% 0,1W
3513	4822 051 20334	330K00 5% 0,1W
3515	4822 051 20153	15K00 5% 0,1W
3516	4822 051 20153	15K00 5% 0,1W
3517	4822 051 20153	15K00 5% 0,1W
3520	4822 051 20104	100K00 5% 0,1W
3521	4822 051 20103	10K00 5% 0,1W
3522	4822 051 20103	10K00 5% 0,1W
3525	4822 051 20104	100K00 5% 0,1W
3526	4822 051 20106	10M00 5% 0,1W
3541	4822 051 20822	8K20 5% 0,1W
3542	4822 051 20153	15K00 5% 0,1W

ELECTRICAL PARTSLIST DOLBY PROLOGIC DECODER

RESISTORS

3543	4822 051 20153	15K00 5% 0,1W
3544	4822 051 20183	18K00 5% 0,1W
3545	4822 051 20562	5K60 5% 0,1W
3546	4822 051 20159	15R00 5% 0,1W
3547	4822 051 20159	15R00 5% 0,1W
3548	4822 051 20153	15K00 5% 0,1W
3549	4822 051 20183	18K00 5% 0,1W
3550	4822 051 20153	15K00 5% 0,1W
3551	4822 051 20105	1M00 5% 0,1W
3552	4822 051 20008	0R00 JUMP. (0805)
3553	4822 051 20472	4K7 CHIP
3555	4822 051 20008	0R00 JUMP. (0805)
3557	4822 051 10102	1K00 2% 0,25W
3558	4822 051 10102	1K00 2% 0,25W
3560	4822 051 20473	47K00 5% 0,1W
3561	4822 051 20223	22K00 5% 0,1W
3562	4822 051 20223	22K00 5% 0,1W
3563	4822 051 20222	2K20 5% 0,1W
3564	4822 051 20222	2K20 5% 0,1W
3565	4822 051 20472	4K70 5% 0,1W
3566	4822 051 20472	4K70 5% 0,1W
3567	4822 051 20472	4K70 5% 0,1W
3568	4822 051 20472	4K70 5% 0,1W
3570	4822 051 10008	0R00 5% 0,25W
3571	4822 051 10008	0R00 5% 0,25W
3572	4822 051 20008	0R00 JUMP. (0805)
3573	4822 051 10008	0R00 5% 0,25W
3574	4822 051 20008	0R00 JUMP. (0805)
3576	4822 051 20472	4K7 CHIP
3586	4822 051 20471	470R00 5% 0,1W
3587	4822 051 20689	68R00 5% 0,1W
3588	4822 117 11139	1K5 1% 0,1W
3589	4822 052 10478	4R70 5% 0,33W
3599	4822 051 20008	0R00 JUMP. (0805)
3600	4822 051 20008	0R00 JUMP. (0805)
3610	4822 051 20008	0R00 JUMP. (0805)
3611	4822 051 20008	0R00 JUMP. (0805)
3612	4822 051 20008	0R00 JUMP. (0805)
3613	4822 051 20008	0R00 JUMP. (0805)
3615	4822 051 10102	1K00 2% 0,25W
3616	4822 051 10102	1K00 2% 0,25W
3619	4822 051 20008	0R00 JUMP. (0805)
3625	4822 051 20008	0R00 JUMP. (0805)
3626	4822 051 20008	0R00 JUMP. (0805)
3627	4822 051 20008	0R00 JUMP. (0805)
3630	4822 051 20473	47K00 5% 0,1W
3631	4822 051 20473	47K00 5% 0,1W
3632	4822 051 20473	47K00 5% 0,1W
3633	4822 051 20472	4K70 5% 0,1W
3634	4822 051 20472	4K70 5% 0,1W
3635	4822 051 20104	100K00 5% 0,1W
3636	4822 051 20104	100K00 5% 0,1W
3637	4822 116 52256	2K2 5% 0,5W
3644	4822 051 20471	470R00 5% 0,1W
3645	4822 051 20104	100K00 5% 0,1W

RESISTORS

3646	4822 050 11002	1K00 1% 0,4W
3647	4822 051 20471	470R00 5% 0,1W
3648	4822 051 20104	100K00 5% 0,1W
3649	4822 050 11002	1K00 1% 0,4W
3651	4822 051 10008	0R00 5% 0,25W
3652	4822 051 20008	0R00 JUMP. (0805)
3653	4822 051 10008	0R00 5% 0,25W
3654	4822 051 20008	0R00 JUMP. (0805)
3656	4822 051 10008	0R00 5% 0,25W
3657	4822 051 10008	0R00 5% 0,25W
3662	4822 051 20008	0R00 JUMP. (0805)
3663	4822 051 20008	0R00 JUMP. (0805)
3664	4822 051 20008	0R00 JUMP. (0805)
3665	4822 051 20008	0R00 JUMP. (0805

FILTER

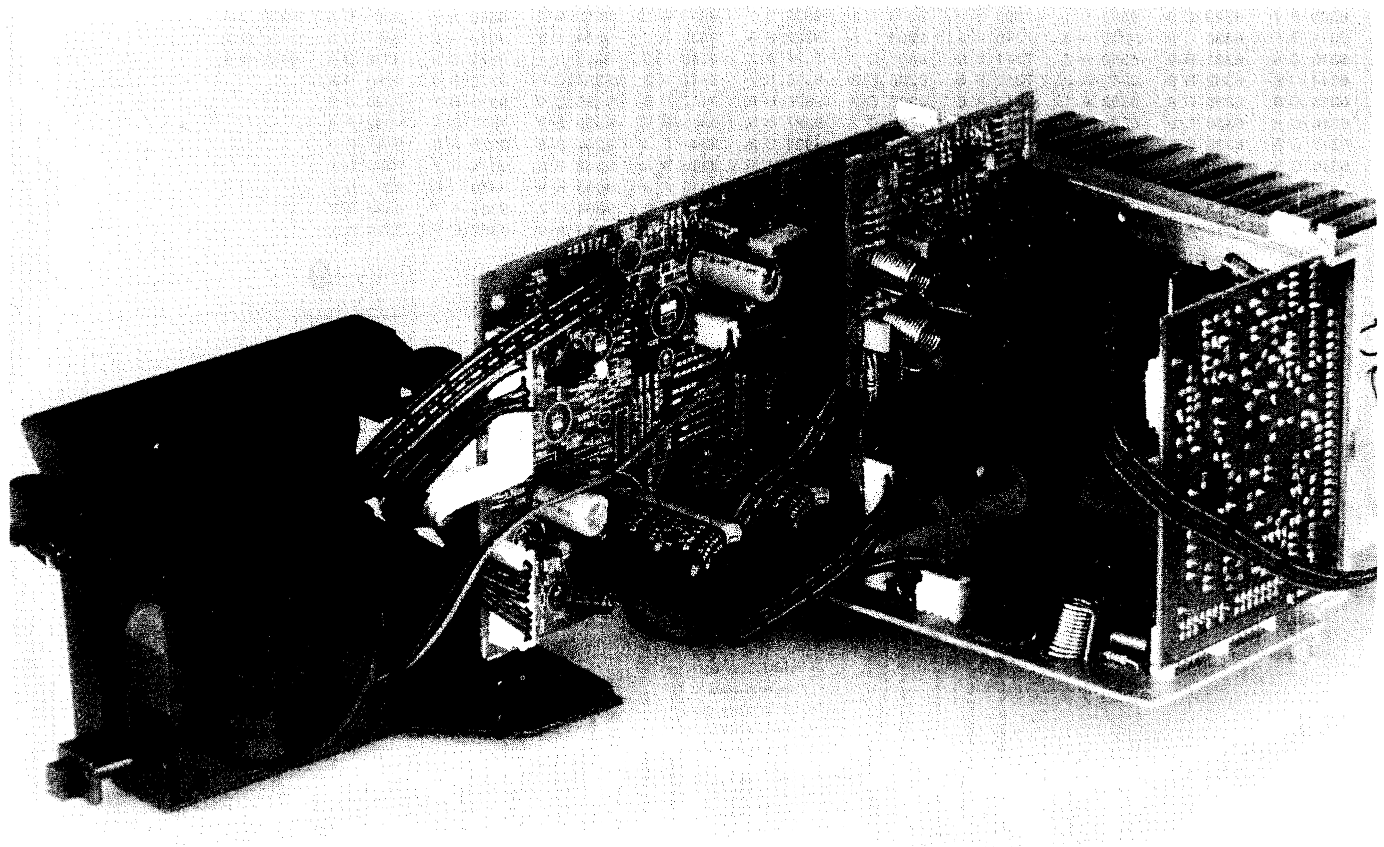
5510	4822 242 81525	CST2.00MG

DIODES

6555	4822 130 30621	1N4148 (COL)
6556	4822 130 30621	1N4148 (COL)
6557	4822 130 30621	1N4148 (COL)
6567	4822 130 61219	BZX79-B10
6568	4822 130 34173	BZX79-C5V6

TRANSISTORS & IC's

7501	4822 209 12986	M69032P
7502	5322 130 41983	BC858B (UAW)
7504	5322 130 41982	BC848B (UAW)
7505	5322 130 41982	BC848B (UAW)
7506	5322 130 41982	BC848B (UAW)
7509	5322 130 41982	BC848B (UAW)
7510	5322 130 41982	BC848B (UAW)
7511	4822 130 10219	DTC114EKA CHIP
7512	4822 130 10219	DTC114EKA CHIP
7541	4822 209 12987	M65830P
7555	5322 209 10883	PCF8574P
7561	4822 209 33652	TEA6321T/V1
7585	4822 130 40937	BC548B(UAW)
7586	4822 130 40937	BC548B(UAW)



POWER BOARD

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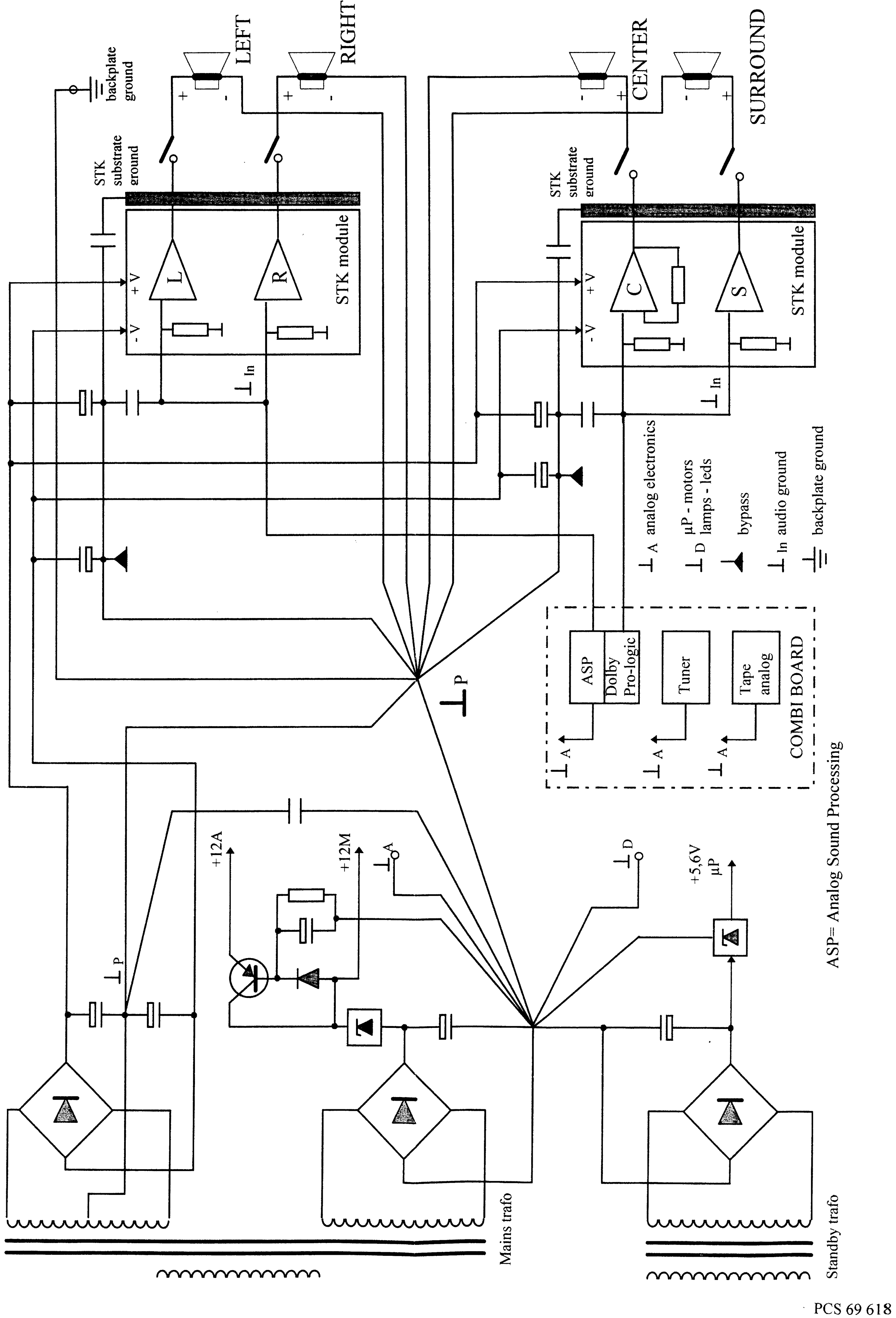
Partslist 12-7

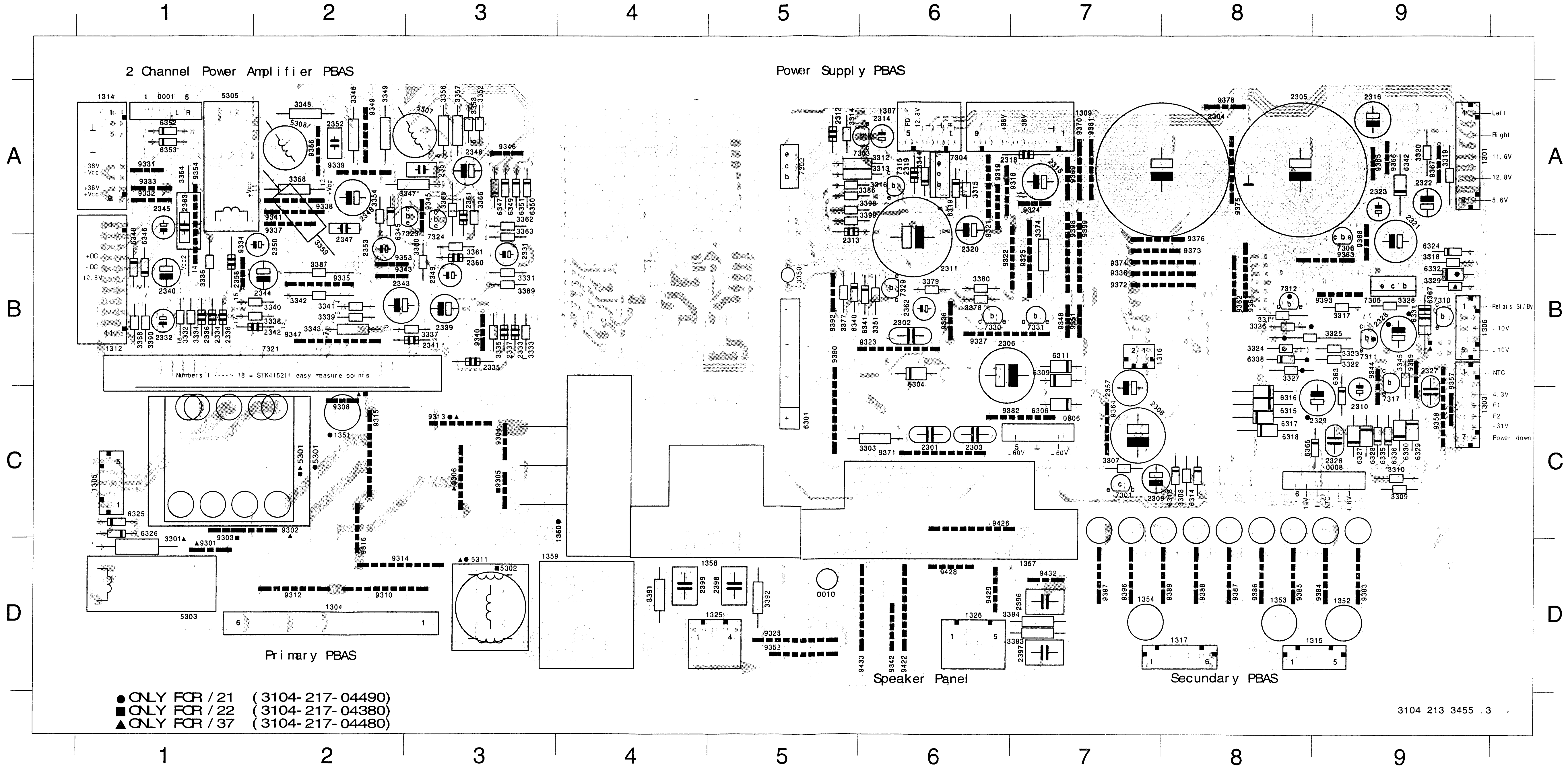
GROUND PLAN MASSA



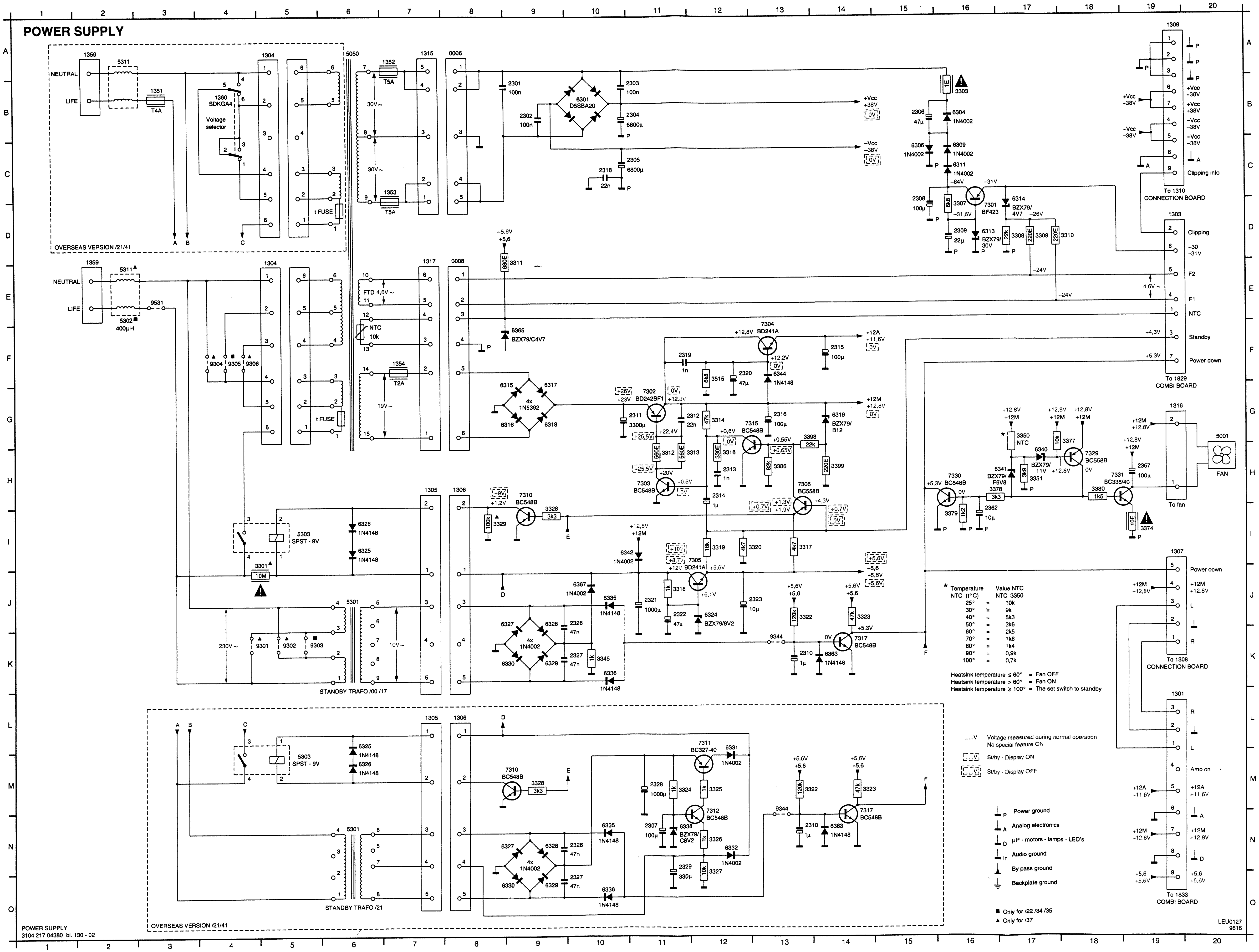
LEFT
RIGHT
CENTER
SURROUND
backplate ground
STK substrate ground
STK module
+V
-V
L
R
C
S
⊥In
⊥P
⊥A analog electronics
⊥D µP - motors lamps - leds
bypass
⊥In audio ground
backplate ground
ASP
Dolby Pro-logic
Tuner
Tape analog
COMBI BOARD
⊥A
+12A
+12M
⊥D
+5,6V µP
Mains trafo
Standby trafo
ASP= Analog Sound Processing

Power Supply & 2 Channel Amplifier Component layout

0001	A 1
0006	C 7
0008	C 9
0010	D 5
0107	C 9
0108	C 9
0109	C 8
0110	C 8
0111	C 8
0112	C 8
0113	C 8
0114	C 7
0115	C 7
0301	C 1
0302	C 1
0303	C 1
0304	C 2
0306	C 2
0307	C 1
0308	C 1
0315	C 2
0319	C 1
1301	A 9
1303	C 9
1304	D 2
1305	C 1
1306	B 9
1307	A 6
1309	A 7
1312	B 1
1314	A 1
1315	D 9
1316	B 7
1317	D 8
1325	D 5
1326	D 6
1351	C 2
1352	D 9
1353	D 8
1354	D 7
1357	D 6
1358	D 5
1359	D 4
1360	C 3
2301	C 6
2302	B 6
2303	C 6
2304	A 7
2305	A 8
2306	B 6
2308	C 7
2309	C 7
2310	C 9
2311	B 6
2312	A 5
2313	A 5
2314	A 6
2315	A 7
2316	A 9
2318	A 7
2319	A 6
2320	A 6
2321	B 9
2322	A 9
2323	A 9
2326	C 9
2327	C 9
2328	B 9
2329	C 9
2331	B 3
2332	B 1
2333	B 3
2334	B 1
2335	B 3
2336	B 1
2337	B 3
2338	B 1
2339	B 3
2340	B 1
2341	B 3
2342	B 2
2343	B 2
2344	B 2
2345	A 1
2346	A 3
2347	A 2
2348	A 2
2349	B 3
2350	B 2
2351	A 3
2352	A 2
2353	B 2
2357	C 7
2358	B 1
2360	B 3
2361	A 3
2362	B 6
2363	A 1
2396	D 7
2397	D 7
2398	D 5
2399	D 4
3301	D 1
3303	C 6
3307	C 7
3308	C 8
3309	C 9
3310	C 9
3311	B 8
3312	A 5
3313	A 5
3314	A 5
3315	A 6
3316	A 5
3317	B 9
3318	B 9
3319	A 9
3320	A 9
3322	B 9
3323	B 9
3324	B 8
3325	B 8
3326	B 8
3327	B 8
3328	B 9
3329	B 9
3331	B 3
3332	B 1
3333	B 3
3334	B 1
3335	B 3
3336	B 1
3337	B 3
3338	B 2
3339	B 2
3340	B 2
3341	B 2
3342	B 2
3343	B 2
3345	B 9
3346	A 2
3347	A 3
3348	A 2
3349	A 2
3350	B 5
3351	B 6
3352	A 3
3353	A 3
3354	A 2
3356	A 3
3357	A 3
3358	A 2
3359	A 2
3360	B 3
3361	B 3
3362	A 3
3363	B 3
3364	A 1
3365	A 3
3366	A 3
3374	B 7
3377	B 5
3378	B 6
3379	B 6
3380	B 6
3386	A 5
3387	B 2
3388	B 1
3389	B 3
3390	B 1
3391	D 4
3392	D 5
3393	D 7
3394	D 7
3398	A 5
3399	A 5
5302	D 3
5303	D 1
5305	A 1
5307	A 3
5308	A 2
5311	D 3
6301	B 5
6304	B 6
6306	C 7
6309	B 7
6311	B 7
6313	C 8
6314	C 8
6315	C 8
6316	C 8
6317	C 8
6318	C 8
6319	A 6
6324	B 9
6325	C 1
6326	C 1
6327	C 9
6328	C 9
6329	C 9
6330	C 9
6331	B 9
6332	B 9
6335	C 9
6336	C 9
6338	B 8
6340	B 5
6341	B 6
6342	A 9
6344	A 6
6345	A 2
6346	B 1
6347	A 3
6348	B 1
6349	A 3
6350	A 3
6351	A 3
6352	A 1
6353	A 1
6363	C 9
6365	C 9
6367	B 9
7301	C 7
7302	A 5
7303	A 6
7304	A 6
7305	B 9
7306	B 9
7310	B 9
7311	B 9
7312	B 8
7315	A 6
7317	B 9
7321	B 2
7323	A 3
7324	A 3
7329	B 6
7330	B 6
7331	B 7
9301	D 1
9302	C 1
9303	C 1
9304	C 3
9305	C 3
9306	C 3
9308	C 2
9310	D 2
9312	D 2
9313	C 3
9314	D 2
9315	C 2
9316	C 2
9318	A 6
9319	A 6
9321	A 6
9322	B 7
9323	B 6
9324	A 7
9325	B 7
9326	B 6
9327	B 6
9328	D 5
9331	A 1
9332	A 1
9333	A 1
9334	B 1
9335	B 2
9336	B 8
9337	A 2
9338	A 2
9339	A 2
9340	B 3
9341	A 2
9342	D 6
9343	B 2
9344	C 9
9345	A 3
9346	A 3
9347	B 2
9348	B 7
9349	A 2
9351	B 7
9352	D 5
9353	B 2
9354	A 1
9356	A 2
9357	C 9
9358	C 9
9359	B 9
9361	B 8
9362	B 8
9363	B 9
9364	C 7
9365	A 9
9366	A 9
9367	A 9
9368	B 9
9369	A 7
9370	A 7
9371	C 6
9372	B 8
9373	B 7
9374	B 8
9375	A 8
9376	B 7
9378	A 8
9381	A 7
9382	C 7
9383	D 9
9384	D 9
9385	D 8
9386	D 8
9387	D 8
9388	D 8
9389	D 8
9390	C 5
9392	B 5
9393	B 9
9396	D 7
9397	D 7
9398	B 7
9399	B 7
9422	D 6
9426	C 6
9428	D 6
9429	D 6
9432	D 7
9433	D 6



● ONLY FOR /21 (3104-217-04490)
■ ONLY FOR /22 (3104-217-04380)
▲ ONLY FOR /37 (3104-217-04480)


POWER SUPPLY
OVERSEAS VERSION /21/41
NEUTRAL
LIFE
1359
5311
1351
T4A
1304
1360 SDKGA4
Voltage selector
t FUSE
5050
1352 T5A
1353 T5A
30V~
1315
0006
2301 100n
2302 100n
6301 D5SBA20
2303 100n
2304 6800µ
2305 6800µ
2318 22n
+Vcc +38V
-Vcc -38V
3303 1E
2306 47µ
6304 1N4002
6306 1N4002
6309 1N4002
6311 1N4002
2308 100µ
3307 6k8
7301 BF423
6314 BZX79/4V7
2309 22µ
6313 BZX79/30V
3308 22k
3309 220E
3310 220E
1309
Clipping info
To 1310 CONNECTION BOARD
1303
Clipping
F2
F1
NTC
Standby
Power down
To 1829 COMBI BOARD
5311 5302 400µH
9531
9304 9305 9306
1317
0008
FTD 4,6V~
NTC 10k
1354 T2A
19V~
3311 680E
6365 BZX79/C4V7
6315 6316 6317 6318 4x 1N5392
7304 BD241A
2315 100µ
+12A +11,6V
7302 BD242BF1
2311 3300µ
2312 22n
2319 1n
3515 6k8
2320 47µ
6344 1N4148
+12M +12,8V
3314 47k
2316 100µ
6319 BZX79/B12
7315 BC548B
3398 22k
3312 560E
3313 560E
3316 330E
3386 82k
3399 220E
7303 BC548B
2313 1n
2314 1µ
7306 BC558B
1305
1306
7310 BC548B
3328 3k3
3329 100k
5303 SPST - 9V
6326 1N4148
6325 1N4148
3301 10M
6342 1N4002
2321 1000µ
3318 1k
3319 18k
3320 4k7
3317 4k7
7305 BD241A
2322 47µ
6324 BZX79/6V2
2323 10µ
3322 120k
3323 47k
7317 BC548B
9344
2310 1µ
6363 1N4148
6367 1N4002
6335 1N4148
6336 1N4148
6327 6328 6329 6330 4x 1N4002
2326 47n
2327 47n
3345 1k
5301
9301 9302 9303
230V~
10V~
STANDBY TRAFO /00 /17
3350 NTC
3377 10k
6340 BZX79/11V
6341 BZX79/F6V8
3351 3k9
7329 BC558B
7330 BC548B
3378 3k3
3379 1k2
2362 10µ
2357 100µ
7331 BC338/40
3380 1k5
3374 10E
1316
5001
FAN
To fan
1307
Power down
To 1308 CONNECTION BOARD
7311 BC327-40
6331 1N4002
2328 1000µ
3324 1k
3325 1k
7312 BC548B
2307 100µ
6338 BZX79/C8V2
3326 1k
6332 1N4002
2329 330µ
3327 10k
STANDBY TRAFO /21
1301
R
L
Amp on
+12A +11,6V
+12M +12,8V
+5,6 +5,6V
To 1833 COMBI BOARD
.....V Voltage measured during normal operation No special feature ON
St/by - Display ON
St/by - Display OFF
P Power ground
A Analog electronics
D µP - motors - lamps - LED's
In Audio ground
By pass ground
Backplate ground
■ Only for /22 /34 /35
▲ Only for /37
LEU0127 9616
POWER SUPPLY
3104 217 04380 bl. 130 - 02

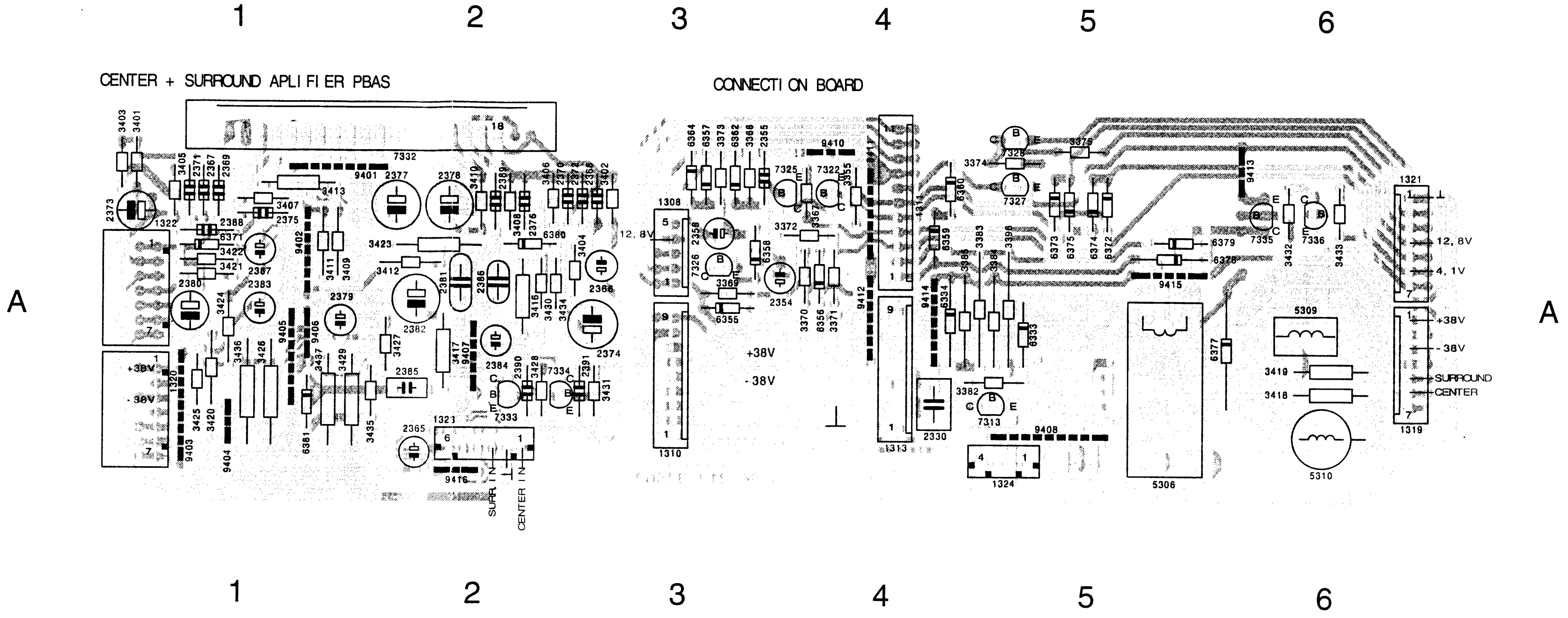
* Temperature NTC (t°C)		Value NTC NTC 3350
25°	=	10k
30°	=	9k
40°	=	5k3
50°	=	3k6
60°	=	2k5
70°	=	1k8
80°	=	1k4
90°	=	0,9k
100°	=	0,7k

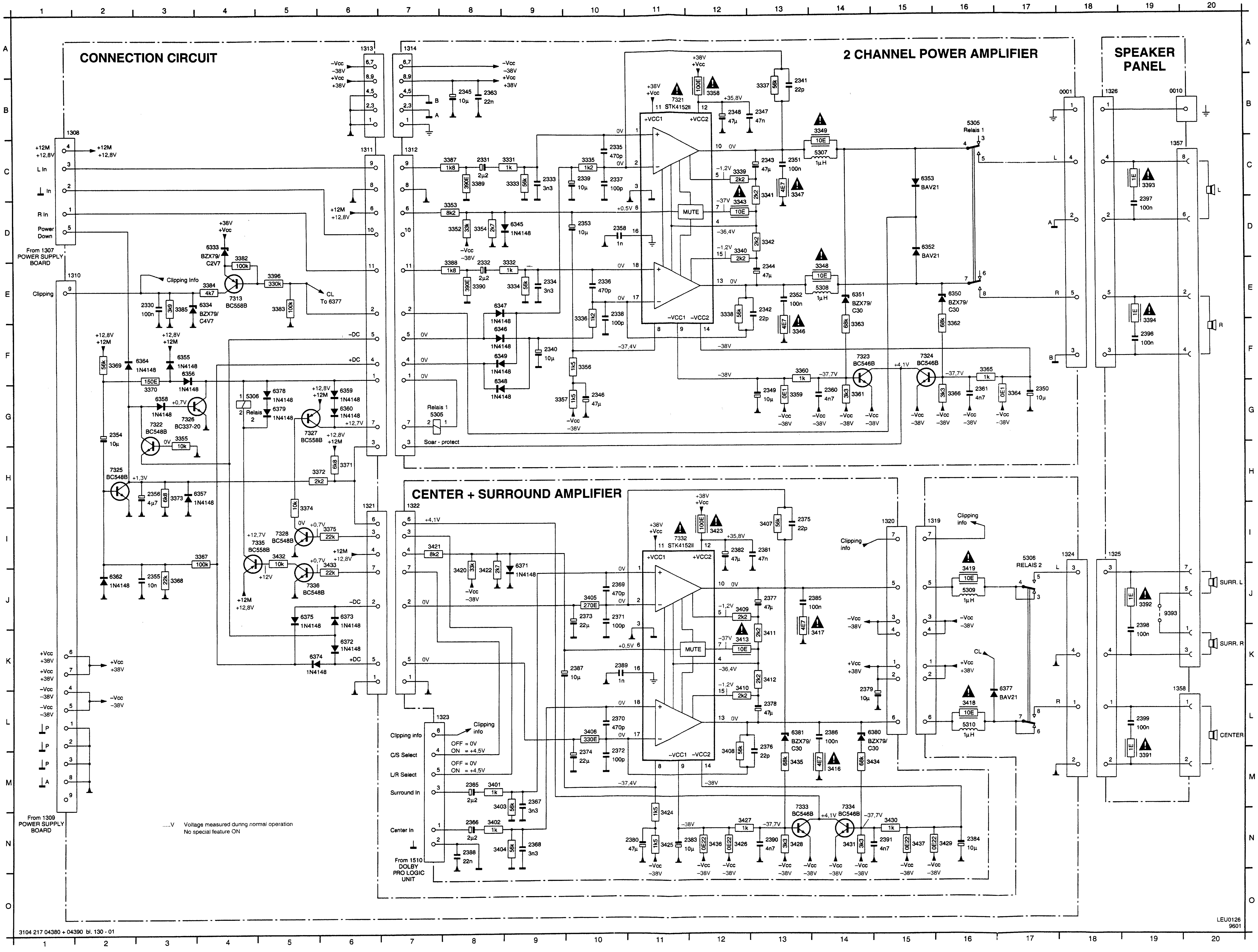
Heatsink temperature ≤ 60° = Fan OFF
Heatsink temperature > 60° = Fan ON
Heatsink temperature ≥ 100° = The set switch to standby

0006	A8
0008	D8
1301	L19
1303	D19
1304	E5
1304	A5
1305	H7
1305	L7
1306	H8
1306	L8
1307	I19
1309	A19
1315	A7
1316	G19
1317	D7
1351	B3
1352	A7
1353	C7
1354	F7
1359	D2
1359	A2
1360	B4
2301	B9
2302	B9
2303	B11
2304	B11
2305	C11
2306	B15
2307	N11
2308	D15
2309	D16
2310	K13
2310	N13
2311	G11
2312	G11
2313	H12
2314	H12
2315	F14
2316	G13
2318	C10
2319	F11
2320	F12
2321	J11
2322	J11
2323	J12
2326	J10
2326	N10
2327	O10
2327	K10
2328	M11
2329	N11
2357	H19
2362	I16
3301	I4
3303	B16
3307	D16
3308	D17
3309	D17
3310	D18
3311	E9
3312	H11
3313	H11
3314	G12
3316	H12
3317	I13
3318	J11
3319	I12
3320	I12
3322	J13
3322	M13
3323	J14
3323	M14
3324	M11
3325	M12
3326	N12
3327	O12
3328	M9
3328	I9
3329	I8
3345	K10
3350	G17
3351	H17
3374	I19
3377	H18
3378	H16
3379	I16
3380	H18
3386	H13
3398	G13
3399	H14
3515	F12
5001	G20
5050	A6
5301	J6
5301	N6
5302	E2
5303	I5
5303	M5
5311	E2
5311	A2
6301	B10
6304	B16
6306	C15
6309	C16
6311	C16
6313	D16
6314	D17
6315	G8
6316	G8
6317	G9
6318	G9
6319	G14
6324	J12
6325	I6
6325	L6
6326	I6
6326	M6
6327	J8
6327	N8
6328	J9
6328	N9
6329	O9
6329	K9
6330	O8
6330	K8
6331	L12
6332	N12
6335	J10
6335	N10
6336	O10
6336	K10
6338	N11
6340	H17
6341	H16
6342	I10
6344	F13
6363	K14
6363	N14
6365	F9
6367	J10
7301	D16
7302	G11
7303	H11
7304	F13
7305	I11
7306	H13
7310	M8
7310	H9
7311	L12
7312	N12
7315	G12
7317	K14
7317	N14
7329	H18
7330	H16
7331	H18
9301	K4
9302	K5
9303	K5
9304	F4
9305	F4
9306	F4
9344	K13
9344	M13
9531	E3

Center Surround amplifier & Connection board Component layout

1308 A 3	1323 A 2	2367 A 1	2375 A 1	2383 A 1	2391 A 3	3373 A 3	3401 A 1	3409 A 1	3419 A 6	3427 A 2	3435 A 1	6355 A 3	6371 A 1	6380 A 2	7332 A 1	9404 A 1	9413 A 6
1310 A 3	1324 A 5	2368 A 3	2376 A 2	2384 A 2	3355 A 4	3374 A 5	3402 A 3	3410 A 2	3420 A 1	3428 A 2	3436 A 1	6356 A 4	6372 A 5	6381 A 1	7333 A 2	9405 A 1	9414 A 4
1311 A 4	2330 A 4	2369 A 1	2377 A 2	2385 A 2	3367 A 4	3375 A 5	3403 A 1	3411 A 1	3421 A 1	3429 A 1	3437 A 1	6357 A 3	6373 A 5	7313 A 5	7334 A 2	9406 A 1	9415 A 5
1313 A 4	2354 A 3	2370 A 2	2378 A 2	2386 A 2	3368 A 3	3382 A 5	3404 A 2	3412 A 2	3422 A 1	3430 A 2	5306 A 5	6358 A 3	6374 A 5	7322 A 4	7335 A 6	9407 A 2	9416 A 2
1319 A 6	2355 A 3	2371 A 1	2379 A 1	2387 A 1	3369 A 3	3383 A 4	3405 A 1	3413 A 1	3423 A 2	3431 A 3	5309 A 6	6359 A 4	6375 A 5	7325 A 4	7336 A 6	9408 A 5	
1320 A 1	2356 A 3	2372 A 3	2380 A 1	2388 A 1	3370 A 4	3384 A 5	3406 A 2	3416 A 2	3424 A 1	3432 A 6	5310 A 6	6360 A 4	6377 A 6	7326 A 3	9401 A 1	9410 A 4	
1321 A 6	2365 A 2	2373 A 1	2381 A 2	2389 A 2	3371 A 4	3385 A 4	3407 A 1	3417 A 2	3425 A 1	3433 A 6	6333 A 5	6362 A 3	6378 A 5	7327 A 5	9402 A 1	9411 A 4	
1322 A 1	2366 A 3	2374 A 3	2382 A 2	2390 A 2	3372 A 4	3396 A 5	3408 A 2	3418 A 6	3426 A 1	3434 A 2	6334 A 4	6364 A 3	6379 A 5	7328 A 5	9403 A 1	9412 A 4	


1
2
3
4
5
6
CENTER + SURROUND APLI FI ER PBAS
CONNECTI ON BOARD
A
A
+38V
-38V
12, 8V
4, 1V
+38V
-38V
SURROUND
CENTER
SURR IN
CENTER IN
1308
1310
1313
1319
1321
1324
5306
5309
5310
7313
7332
7333
7334
1
2
3
4
5
6


CONNECTION CIRCUIT
2 CHANNEL POWER AMPLIFIER
SPEAKER PANEL
CENTER + SURROUND AMPLIFIER
+12M
+12,8V
L In
R In
Power Down
From 1307 POWER SUPPLY BOARD
Clipping
Clipping Info
CL To 6377
1308
1310
1311
1312
1313
1314
-Vcc -38V
+Vcc +38V
7321 STK4152II
7332 STK4152II
+VCC1
+VCC2
-VCC1
-VCC2
MUTE
5305 Relais 1
5306 RELAIS 2
Relais 1 5305
Soar - protect
5306 Relais 2
BC558B
BC548B
BC337-20
BC546B
BZX79/ C2V7
BZX79/ C4V7
BZX79/ C30
1N4148
BAV21
5307 1μH
5308 1μH
5309 1μH
5310 1μH
L
R
SURR. L
SURR. R
CENTER
0001
0010
1326
1357
1358
1319
1320
1321
1322
1323
1324
1325
Clipping info
C/S Select
L/R Select
Surround In
Center In
OFF = 0V ON = +4,5V
From 1510 DOLBY PRO LOGIC UNIT
From 1309 POWER SUPPLY BOARD
3104 217 04380 + 04390 bl. 130 - 01
LEU0126 9601

....V Voltage measured during normal operation
No special feature ON

0001	B18	3382	D4
0010	B19	3383	E5
1308	B1	3384	E4
1310	E1	3385	E3
1311	C6	3387	C8
1312	C7	3388	E8
1313	A6	3389	C8
1314	A7	3390	E8
1319	I15	3391	M19
1320	I15	3392	J19
1321	I6	3393	C19
1322	I7	3394	F19
1323	L7	3396	E5
1324	I18	3401	M8
1325	I18	3402	N8
1326	B18	3403	M8
1357	C19	3404	N8
1358	L19	3405	J10
2330	E3	3406	L10
2331	C8	3407	I13
2332	E8	3408	M12
2333	C9	3409	J12
2334	E9	3410	L12
2335	C10	3411	K13
2336	E10	3412	K13
2337	C10	3413	K12
2338	E10	3416	M14
2339	C10	3417	K13
2340	F9	3418	L16
2341	B13	3419	J16
2342	E13	3420	J8
2343	C13	3421	I7
2344	E13	3422	J8
2345	B8	3423	I12
2346	G10	3424	N11
2347	B13	3425	N11
2348	B12	3426	N12
2349	G13	3427	N12
2350	G17	3428	N13
2351	C13	3429	N16
2352	E13	3430	N15
2353	D10	3431	N14
2354	G2	3432	I5
2355	J3	3433	I6
2356	H3	3434	M14
2358	D10	3435	M13
2360	G14	3436	N12
2361	G16	3437	N15
2363	B8	5305	G7
2365	M8	5305	B16
2366	N8	5306	I17
2367	M9	5307	C14
2368	N9	5308	E14
2369	J10	5309	J16
2370	L10	5310	L16
2371	J10	6333	D4
2372	M10	6334	E4
2373	J10	6345	D9
2374	M10	6346	F8
2375	I13	6347	E8
2376	M13	6348	F8
2377	J13	6349	F8
2378	L13	6350	E16
2379	L14	6351	E14
2380	N10	6352	D15
2381	I13	6353	C15
2382	I12	6355	F3
2383	N11	6356	F3
2384	N16	6357	H3
2385	J13	6358	G3
2386	L14	6359	G6
2387	K10	6360	G6
2388	N8	6362	J2
2389	K10	6364	F3
2390	N13	6371	J9
2391	N15	6372	K6
2396	F19	6373	J6
2397	D19	6374	K5
2398	K19	6375	J5
2399	L19	6377	L17
3331	C8	6378	G5
3332	E8	6379	G5
3333	C9	6380	L14
3334	E9	6381	L13
3335	C10	7313	E4
3336	E10	7321	B11
3337	B13	7322	G3
3338	E12	7323	F14
3339	C12	7324	F15
3340	D12	7325	H2
3341	C13	7326	G3
3342	D13	7327	G5
3343	D12	7328	I5
3346	F13	7332	I11
3347	C13	7333	N13
3348	E14	7334	N14
3349	B14	7335	I4
3352	D8	7336	J5
3353	D8	9393	J19
3354	D8		
3355	G3		
3356	F10		
3357	G9		
3358	B12		
3359	G13		
3360	F13		
3361	G14		
3362	F16		
3363	F14		
3364	G17		
3365	F16		
3366	G16		
3367	I3		
3368	J3		
3369	F2		
3370	G3		
3371	H6		
3372	H5		
3373	H3		
3374	I5		
3375	I6		

ELECTRICAL PARTSLIST POWER MODULE Power supply & 2 Channel Amplifier board

MISCELLANEOUS

1351	4822 071 54002	FUSE 4A only /21/41
1352	4822 071 55002	FUSE 5A
1353	4822 071 55002	FUSE 5A
1354	4822 071 52002	FUSE 2A
1357	4822 265 10463	CONN. BM PUSH H 8P.
1358	4822 265 10464	CONN.BM PUSH H 2P F
1360	4822 272 10315	VOLT. SEL. only /21/41
5001	4822 361 10689	FAN MOTOR
5050	4822 146 10426	MAINS TRAFO
5050	4822 123 12345	MAINS TRAFO only 21/41
5301	4822 146 10437	ST/BY TRAFO
5301	4822 146 10466	ST/BY TRAFO / only 21/41
5302	4822 157 71285	CHOKE COIL
5303	4822 280 10299	RELAY 9V 15A
5305	4822 280 80777	RELAY VB-12STBU
5311	4822 157 10519	CHOKE COIL only /21/41

CAPACITORS

2301	4822 121 41853	100NF10% 100V
2302	4822 121 41853	100NF10% 100V
2303	4822 121 41853	100NF10% 100V
2304	4822 124 11504	6800U 20%50V
2305	4822 124 11504	6800U 20%50V
2306	4822 124 41751	47UF 20% 50V
2307	4822 124 41584	100UF 10V only /21/41
2308	4822 124 11505	100UF 100V
2309	4822 124 41596	22UF20% 50V
2310	4822 124 40242	1UF 50V
2311	4822 124 42367	3300UF20% 35V
2312	4822 126 11585	22NF+80-20% Y5V 25V
2313	4822 122 33197	1NF 10% 50V
2314	4822 124 40242	1UF20% 63V
2315	4822 124 41525	100UF 20% 25V
2316	4822 124 41525	100UF 20% 25V
2318	4822 126 11585	22NF+80-20% Y5V 25V
2319	4822 122 33197	1NF 10% 50V
2320	4822 124 40433	47UF20% 25V
2321	4822 124 40201	1000UF 16V
2322	4822 124 40433	47UF20% 25V
2323	4822 124 41579	10UF 20% 50V
2326	4822 121 43526	47NF 5% 250V
2327	4822 121 43526	47NF 5% 250V
2328	4822 124 40255	100UF 50V only /21/41
2329	4822 124 40849	330UF 16V only /21/41
2331	4822 124 41576	2,2UF 20% 50V
2332	4822 124 41576	2,2UF 20% 50V
2333	4822 122 10577	3,3NF10% 16V
2334	4822 122 10577	3,3NF10% 16V
2335	4822 122 33519	470PF10% 50V
2336	4822 122 33519	470PF10% 50V
2337	4822 122 33195	100PF 10% 50V
2338	4822 122 33195	100PF 10% 50V
2339	4822 124 40248	10UF20% 63V
2340	4822 124 40248	10UF20% 63V
2341	4822 122 33191	22PF 5% 50V
2342	4822 122 33191	22PF 5% 50V
2343	4822 124 80196	47UF20% 50V
2344	4822 124 80196	47UF20% 50V

CAPACITORS

2345	4822 124 40248	10UF20% 63V
2346	4822 124 40433	47UF20% 25V
2347	4822 121 43526	47NF 5% 250V
2348	4822 124 80196	47UF20% 50V
2349	4822 124 41402	10UF 20% 50V
2350	4822 124 41402	10UF 20% 50V
2351	5322 121 42386	100NF 5% 63V
2352	5322 121 42386	100NF 5% 63V
2353	4822 124 40246	4,7UF 20% 63V
2357	4822 124 41525	100UF 20% 25V
2358	4822 122 33197	1NF 10% 50V
2360	4822 126 11714	4,7NF20%
2361	4822 126 11714	4,7NF20%
2362	4822 124 41579	10UF 20% 50V
2363	4822 121 41856	22N 100V
2396	5322 121 42386	100NF 5% 63V
2397	5322 121 42386	100NF 5% 63V
2398	5322 121 42386	100NF 5% 63V
2399	5322 121 42386	100NF 5% 63V

RESISTORS

3303	4822 052 10108	1R00 5% 0,33W
3307	4822 116 52296	6K8 5% 0,5W
3308	4822 116 52257	22K 5% 0,5W
3309	4822 116 52215	220E 5% 0,5W
3310	4822 116 52215	220E 5% 0,5W
3311	4822 116 52228	680E 5% 0,5W
3312	4822 050 25601	560R00 1% 0,6W
3313	4822 050 25601	560R00 1% 0,6W
3314	4822 116 52284	47K 5% 0,5W
3315	4822 116 52296	6K8 5% 0,5W
3316	4822 116 52219	330E 5% 0,5W
3317	4822 116 52283	4K7 5% 0,5W
3318	4822 050 11002	1K00 1% 0,4W
3319	4822 116 52251	18K 5% 0,5W
3320	4822 116 52283	4K7 5% 0,5W
3322	4822 116 52239	120K
3323	4822 116 52284	47K 5% 0,5W
3324	4822 050 11002	1K only /21/41
3325	4822 050 11002	1K only / /21/41
3326	4822 050 11002	1K only / /21/41
3327	4822 116 83864	10K only / /21/41
3328	4822 116 52269	3K3 5% 0,5W
3331	4822 050 11002	1K00 1% 0,4W
3332	4822 050 11002	1K00 1% 0,4W
3333	4822 116 52291	56K 5% 0,5W
3334	4822 116 52291	56K 5% 0,5W
3335	4822 116 52207	1K2 5% 0,5W
3336	4822 116 52207	1K2 5% 0,5W
3337	4822 116 52291	56K 5% 0,5W
3338	4822 116 52291	56K 5% 0,5W
3339	4822 116 52256	2K2 5% 0,5W
3340	4822 116 52256	2K2 5% 0,5W
3341	4822 116 52256	2K2 5% 0,5W
3342	4822 116 52256	2K2 5% 0,5W
3343	4822 052 10109	10R00 5% 0,33W
3345	4822 050 11002	1K
3346	4822 052 10478	4R70 5% 0,33W
3347	4822 052 10478	4R70 5% 0,33W
3348	4822 052 10109	10R00 5% 0,33W

ELECTRICAL PARTSLIST POWER MODULE Power supply & 2 Channel Amplifiier board

RESISTORS

3349	4822 052 10109	10R00 5% 0,33W
3350	4822 117 12063	NTC DC 5W 10K 5%
3351	4822 116 52276	3K9 5% 0,5W
3352	4822 116 52271	33K 5% 0,5W
3353	4822 116 52303	8K2 5% 0,5W
3354	4822 116 52263	2K7 5% 0,5W
3356	4822 116 52243	1K5 5% 0,5W
3357	4822 116 52243	1K5 5% 0,5W
3358	4822 052 10101	100R00 5% 0,33W
3359	4822 113 80633	0R1 5% 3W
3360	4822 050 11002	1K00 1% 0,4W
3361	4822 116 52269	3K3 5% 0,5W
3362	4822 116 52297	68K 5% 0,5W
3363	4822 116 52297	68K 5% 0,5W
3364	4822 113 80633	0R1 5% 3W
3365	4822 050 11002	1K00 1% 0,4W
3366	4822 116 52269	3K3 5% 0,5W
3374	4822 052 10109	10R00 5% 0,33W
3377	4822 116 83864	10K 5% 0,5W
3378	4822 116 52269	3K3 5% 0,5W
3379	4822 116 52207	1K2 5% 0,5W
3380	4822 116 52243	1K5 5% 0,5W
3386	4822 116 52304	82K 5% 0,5W
3387	4822 116 52243	1K5 5% 0,5W
3388	4822 116 52243	1K5 5% 0,5W
3389	4822 116 52222	390E 5% 0,5W
3390	4822 116 52222	390E 5% 0,5W
3391	4822 052 10108	1R00 5% 0,33W
3392	4822 052 10108	1R00 5% 0,33W
3393	4822 052 10108	1R00 5% 0,33W
3394	4822 052 10108	1R00 5% 0,33W
3398	4822 116 52257	22K 5% 0,5W
3399	4822 116 52215	220E 5% 0,5W

COILS

5307	4822 157 70599	COIL
5308	4822 157 70599	COIL

DIODES

6301	4822 130 82078	D5SBA20
6304	5322 130 30684	1N4002GP (UAW)
6306	5322 130 30684	1N4002GP (UAW)
6309	5322 130 30684	1N4002GP (UAW)
6311	5322 130 30684	1N4002GP (UAW)
6313	4822 130 34328	BZX79-C30
6314	4822 130 34174	BZX79-C4V7 (COL)
6315	5322 130 80686	1N5392
6316	5322 130 80686	1N5392
6317	5322 130 80686	1N5392
6318	5322 130 80686	1N5392
6319	4822 130 34197	BZX79-B12
6324	4822 130 34167	BZX79-C6V2 (UAW)
6325	4822 130 30621	1N4148 (COL)
6326	4822 130 30621	1N4148 (COL)
6327	5322 130 30684	1N4002GP (UAW)
6328	5322 130 30684	1N4002GP (UAW)
6329	5322 130 30684	1N4002GP (UAW)
6330	5322 130 30684	1N4002GP (UAW)
6331	5322 130 30684	1N4002GP only //21/41

DIODES

6332	5322 130 30684	1N4002GP only / /21/41
6335	4822 130 30621	1N4148 (COL)
6336	4822 130 30621	1N4148 (COL)
6338	4822 130 34382	BZX79-C8V2 only /21/41
6340	4822 130 34488	BZX79-C11 (COL)
6341	4822 130 34278	BZX79-F6V8 (COL)
6342	5322 130 30684	1N4002GP (UAW)
6344	4822 130 30621	1N4148 (COL)
6345	4822 130 30621	1N4148 (COL)
6346	4822 130 30621	1N4148 (COL)
6347	4822 130 30621	1N4148 (COL)
6348	4822 130 30621	1N4148 (COL)
6349	4822 130 30621	1N4148 (COL)
6350	4822 130 34328	BZX79-C30
6351	4822 130 34328	BZX79-C30
6352	4822 130 30842	BAV21
6353	4822 130 30842	BAV21
6363	4822 130 30621	1N4148 (COL)
6365	4822 130 34174	BZX79C 4V7
6367	5322 130 30684	1N4002GP

TRANSISTORS & IC's

7301	4822 130 41646	BF423
7302	4822 130 63575	BD242BFI
7303	4822 130 40937	BC548B(UAW)
7304	4822 130 63539	BD241A
7305	4822 130 63539	BD241A
7306	4822 130 44197	BC558B(UAW)
7310	4822 130 44196	BC548C(UAW)
7311	4822 130 41327	BC327-40 only /21/41
7312	4822 130 40937	BC548B only /21/41
7315	4822 130 40937	BC548B(UAW)
7317	4822 130 40937	BC548B(UAW)
7321	4822 209 30175	IC STK4152II
7323	4822 130 44461	BC546B
7324	4822 130 44461	BC546B
7329	4822 130 44197	BC558B(UAW)
7330	4822 130 40937	BC548B(UAW)
7331	5322 130 44779	BC338-40 (UAW)

ELECTRICAL PARTSLIST POWER MODULE Center + Surround Amplifier & connection board

MISCELLANEOUS

1359	4822 265 31016	CONNECTOR ELECT

CAPACITORS

2330	5322 121 42386	100NF 50V
2354	4822 124 41579	10UF 20% 50V
2355	4822 121 51387	10NF20% 16V
2356	4822 124 40246	4,7UF20% 63V"
2365	4822 124 41576	2,2UF 20% 50V"
2366	4822 124 41576	2,2UF 20% 50V"
2367	4822 122 10577	3,3NF10% 16V"
2368	4822 122 10577	3,3NF10% 16V"
2369	4822 122 33519	470PF10% 50V
2370	4822 122 33519	470PF10% 50V
2371	4822 122 33195	100PF 10% 50V
2372	4822 122 33195	100PF 10% 50V
2373	4822 124 41596	22UF20% 50V
2374	4822 124 41596	22UF20% 50V
2375	4822 122 33191	22PF 5% 50V
2376	4822 122 33191	22PF 5% 50V
2377	4822 124 41751	47UF 20% 50V
2378	4822 124 41751	47UF 20% 50V
2379	4822 124 41579	10UF 20% 50V
2380	4822 124 40433	47UF20% 25V
2381	4822 121 43526	47NF 5% 250V
2382	4822 124 41751	47UF 20% 50V
2383	4822 124 41579	10UF 20% 50V
2384	4822 124 41579	10UF 20% 50V
2385	5322 121 42386	100NF 5% 63V
2386	5322 121 42386	100NF 5% 63V
2387	4822 124 41579	10UF 20% 50V
2388	4822 126 11585	22NF+80-20% Y5V 25V
2389	4822 122 33197	1NF 10% 50V
2390	4822 126 11714	4,7NF20%"
2391	4822 126 11714	4,7NF20%"

RESISTORS

3355	4822 116 83864	10K 5% 0,5W"
3367	4822 116 52234	100K 5% 0,5W"
3368	4822 116 52257	22K 5% 0,5W"
3369	4822 116 52291	56K 5% 0,5W"
3370	4822 116 83868	150R 5% 0,5W"
3371	4822 116 52296	6K8 5% 0,5W"
3372	4822 116 52256	2K2 5% 0,5W"
3373	4822 116 52296	6K8 5% 0,5W"
3374	4822 116 83864	10K 5% 0,5W"
3375	4822 116 52257	22K 5% 0,5W"
3382	4822 116 52234	100K"
3383	4822 116 52234	100K"
3384	4822 116 52283	4K7"
3385	4822 116 52276	3K9 5% 0,5W"
3396	4822 116 52272	330K"
3401	4822 050 11002	1K00 1% 0,4W"

RESISTORS

3402	4822 050 11002	1K00 1% 0,4W"
3403	4822 116 52291	56K 5% 0,5W"
3404	4822 116 52291	56K 5% 0,5W"
3405	4822 116 52217	270E
3406	4822 116 52219	330E
3407	4822 116 52291	56K 5% 0,5W"
3408	4822 116 52291	56K 5% 0,5W"
3409	4822 116 52256	2K2 5% 0,5W"
3410	4822 116 52256	2K2 5% 0,5W"
3411	4822 116 52256	2K2 5% 0,5W"
3412	4822 116 52256	2K2 5% 0,5W"
3413	4822 052 10109	10R00 5% 0,33W
3416	4822 052 10478	4R70 5% 0,33W
3417	4822 052 10478	4R70 5% 0,33W"
3418	4822 052 10109	10R00 5% 0,33W"
3419	4822 052 10109	10R00 5% 0,33W"
3420	4822 116 52271	33K 5% 0,5W"
3421	4822 116 52303	8K2 5% 0,5W"
3422	4822 116 52263	2K7 5% 0,5W"
3423	4822 052 10101	100R00 5% 0,33W"
3424	4822 116 52243	1K5 5% 0,5W"
3425	4822 116 52243	1K5 5% 0,5W"
3426	4822 117 11744	0R22 5% 1W"
3427	4822 050 11002	1K00 1% 0,4W"
3428	4822 116 52269	3K3 5% 0,5W"
3429	4822 117 11744	0R22 5% 1W"
3430	4822 050 11002	1K00 1% 0,4W"
3431	4822 116 52269	3K3 5% 0,5W"
3432	4822 116 83864	10K 5% 0,5W"
3433	4822 116 52257	22K 5% 0,5W"
3434	4822 116 52297	68K 5% 0,5W"
3435	4822 116 52297	68K 5% 0,5W"
3436	4822 117 11744	0R22 5% 1W"
3437	4822 117 11744	0R22 5% 1W"

COILS

5306	4822 280 80777	RELAY
5309	4822 157 62255	COIL
5310	4822 157 70599	COIL

DIODES

6333	5322 130 34563	BZX79C 2V7
6334	4822 130 34174	BZX79C 4V7
6355	4822 130 30621	1N4148 (COL)
6356	4822 130 30621	1N4148 (COL)
6357	4822 130 30621	1N4148 (COL)
6358	4822 130 30621	1N4148 (COL)
6359	4822 130 30621	1N4148 (COL)

ELECTRICAL PARTSLIST POWER MODULE Center + Surround Amplifier & connection board

DIODES

6360	4822 130 30621	1N4148 (COL)
6362	4822 130 30621	1N4148 (COL)
6364	4822 130 30621	1N4148 (COL)
6371	4822 130 30621	1N4148 (COL)
6372	4822 130 30621	1N4148 (COL)
6373	4822 130 30621	1N4148 (COL)
6374	4822 130 30621	1N4148 (COL)
6375	4822 130 30621	1N4148 (COL)
6377	4822 130 30842	BAV21
6378	4822 130 30621	1N4148 (COL)
6379	4822 130 30621	1N4148 (COL)
6380	4822 130 34328	BZX79-C30
6381	4822 130 34328	BZX79-C30

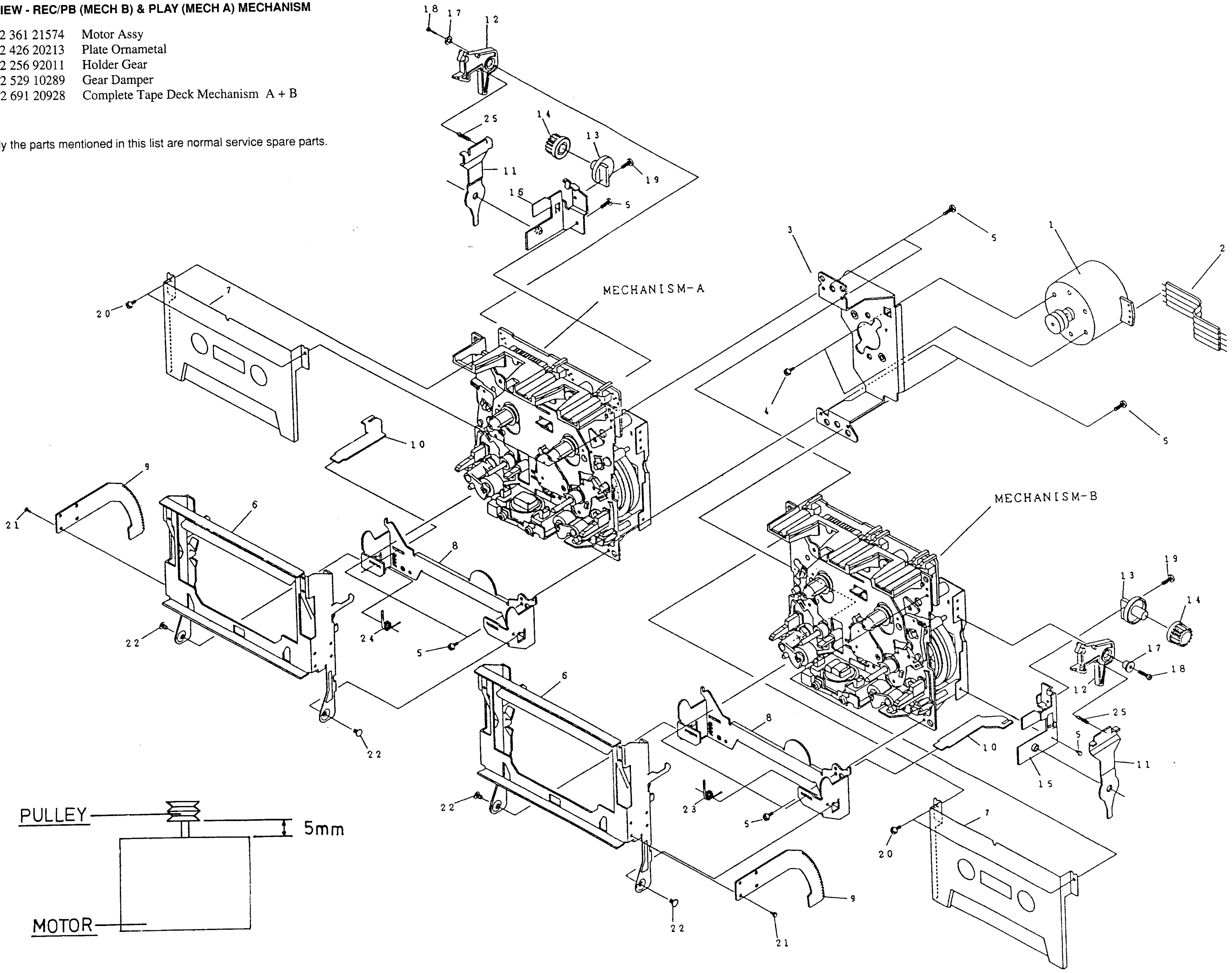
TRANSISTORS & IC's

7313	4822 130 41691	BC556B
7322	4822 130 40937	BC548B(UAW)
7325	4822 130 40937	BC548B(UAW)
7326	4822 130 41344	BC337-40
7327	4822 130 44197	BC558B(UAW)
7328	4822 130 40937	BC548B(UAW)
7332	4822 209 30175	IC STK4152II
7333	4822 130 44461	BC546B
7334	4822 130 44461	BC546B
7335	4822 130 44197	BC558B(UAW)
7336	4822 130 40937	BC548B(UAW)

EXPLODED VIEW - REC/PB (MECH B) & PLAY (MECH A) MECHANISM

1	4822 361 21574	Motor Assy
7	4822 426 20213	Plate Ornametal
13	4822 256 92011	Holder Gear
14	4822 529 10289	Gear Damper
	4822 691 20928	Complete Tape Deck Mechanism A + B

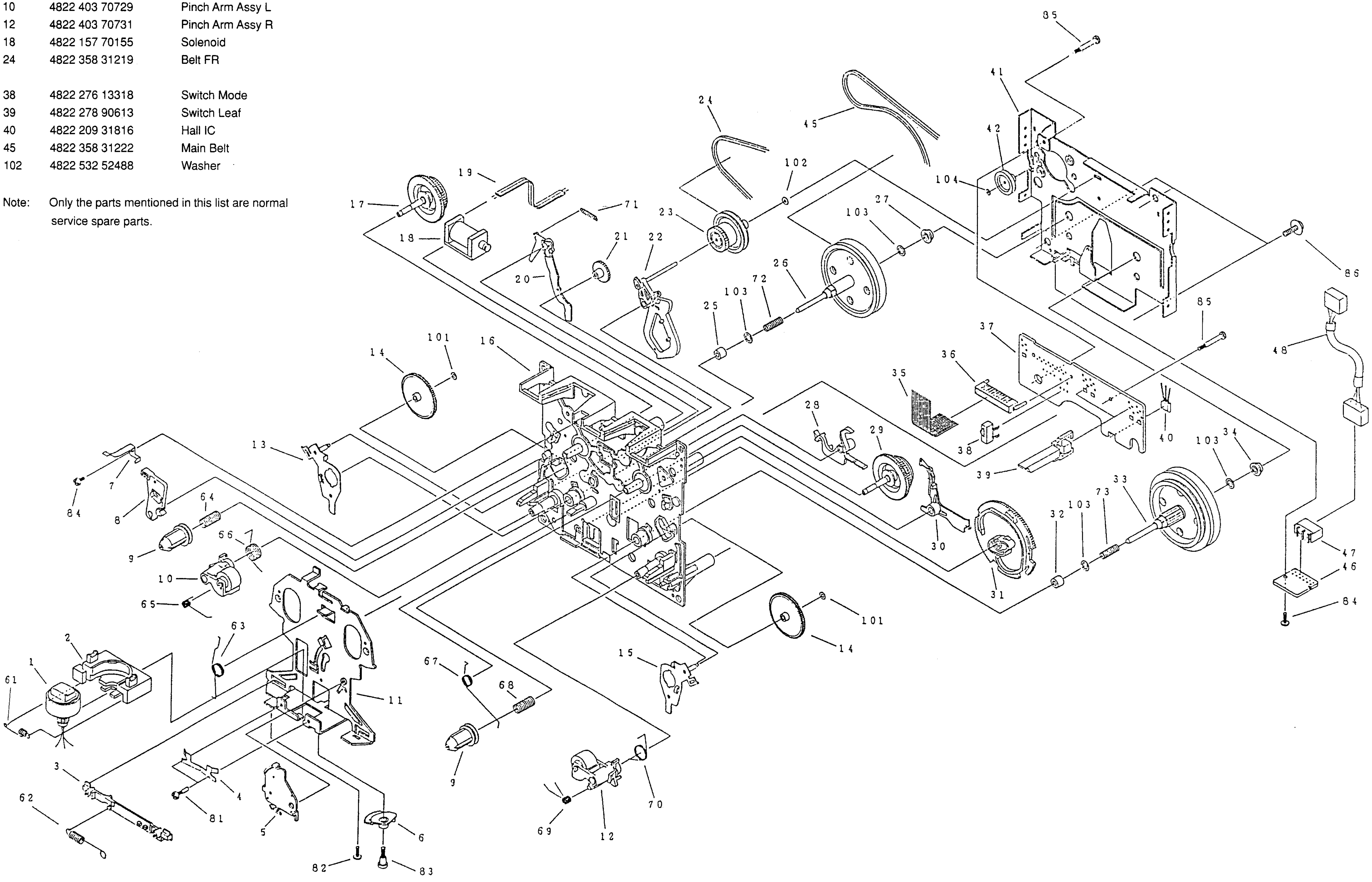
Note: Only the parts mentioned in this list are normal service spare parts.


MECHANISM-A
MECHANISM-B
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
PULLEY
5mm
MOTOR

EXPLODED VIEW - PLAY (MECH A) MECHANISM

1	4822 249 30189	Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31222	Main Belt
102	4822 532 52488	Washer

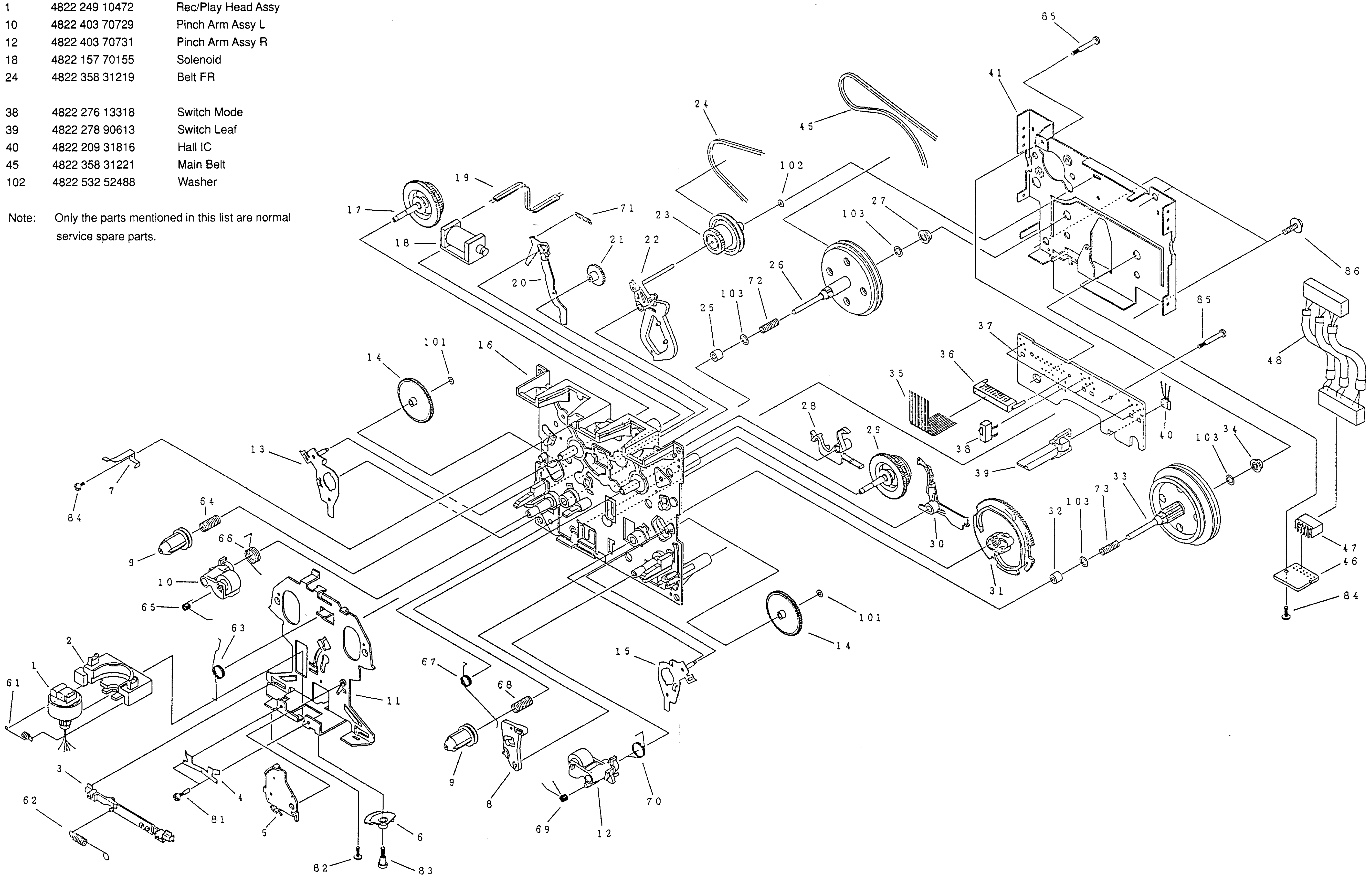
Note: Only the parts mentioned in this list are normal service spare parts.


85
41
24
45
42
102
104
19
17
71
23
27
103
18
21
22
86
20
26
72
103
25
85
37
101
16
14
36
48
35
28
29
40
103
34
13
38
39
33
7
84
73
64
103
32
8
66
30
47
46
9
10
31
84
65
101
63
14
2
15
67
68
61
1
11
3
70
9
62
4
81
69
12
5
6
82
83

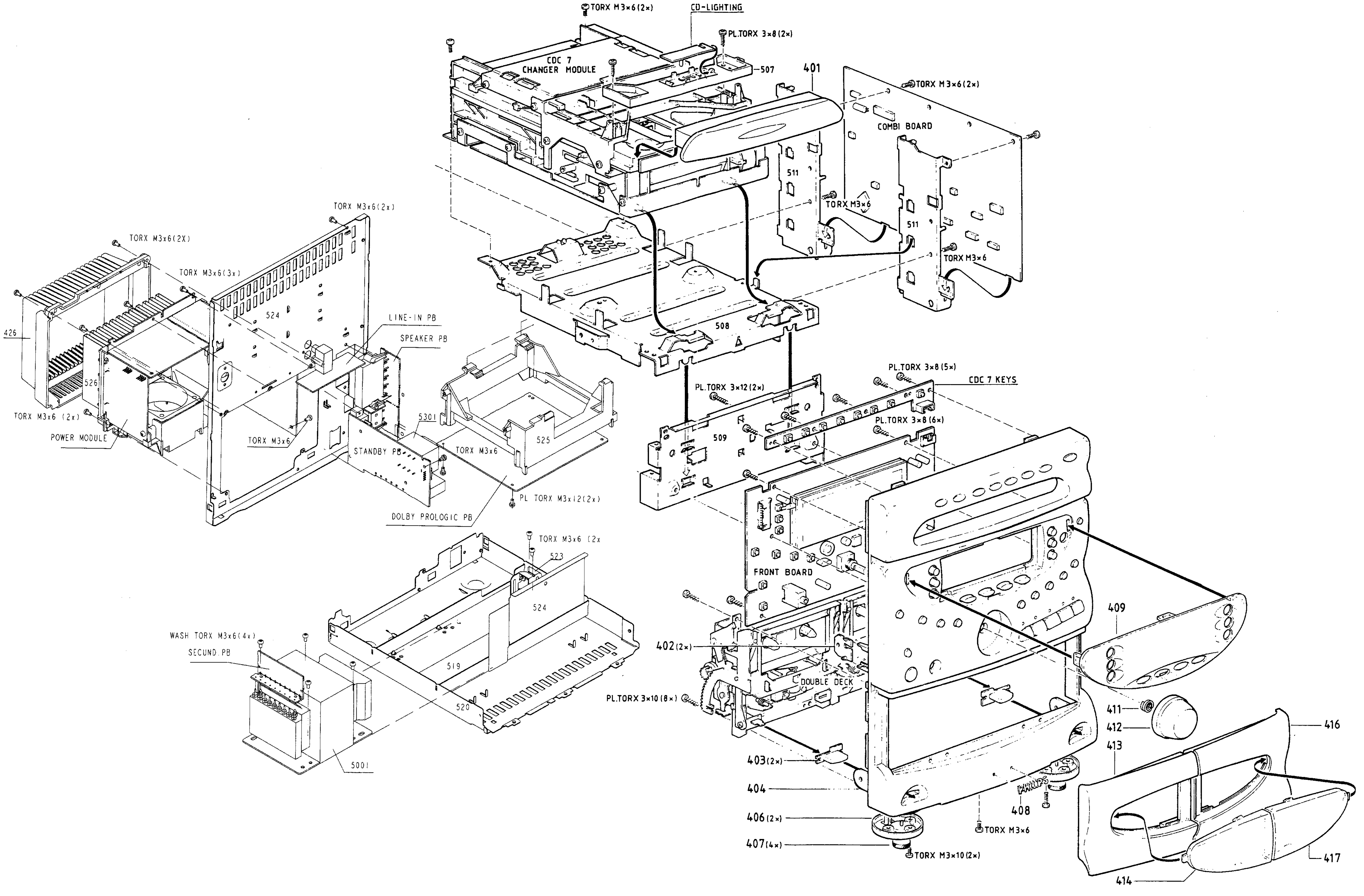
EXPLODED VIEW - REC/PB (MECH B) MECHANISM

1	4822 249 10472	Rec/Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31221	Main Belt
102	4822 532 52488	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


85
41
24
45
102
19
71
17
18
23
103
27
86
21
22
20
26
72
103
25
85
37
36
48
101
16
14
35
28
40
29
103
34
38
13
39
33
73
7
32
103
84
64
66
9
30
47
46
10
31
84
65
63
101
14
2
15
1
61
67
11
68
3
62
4
81
9
70
5
6
8
69
12
82
83

EXPLODED VIEW OF SET I


TORX M3x6 (2x)
CD-LIGHTING
PL.TORX 3x8 (2x)
CDC 7
CHANGER MODULE
507
401
TORX M3x6 (2x)
COMBI BOARD
511
TORX M3x6
511
TORX M3x6
TORX M3x6 (2x)
TORX M3x6 (2X)
TORX M3x6 (3x)
524
426
526
LINE-IN PB
SPEAKER PB
508
TORX M3x6 (2x)
POWER MODULE
TORX M3x6
5301
STANDBY PB
TORX M3x6
525
PL TORX M3x12 (2x)
DOLBY PROLOGIC PB
PL.TORX 3x8 (5x)
CDC 7 KEYS
PL.TORX 3x12 (2x)
PL.TORX 3x8 (6x)
509
FRONT BOARD
TORX M3x6 (2x
523
524
WASH TORX M3x6 (4x)
SECUND PB
519
520
5001
409
402 (2x)
DOUBLE DECK
PL.TORX 3x10 (8x)
411
412
413
416
403 (2x)
404
406 (2x)
408
TORX M3x6
407 (4x)
TORX M3x10 (2x)
417
414

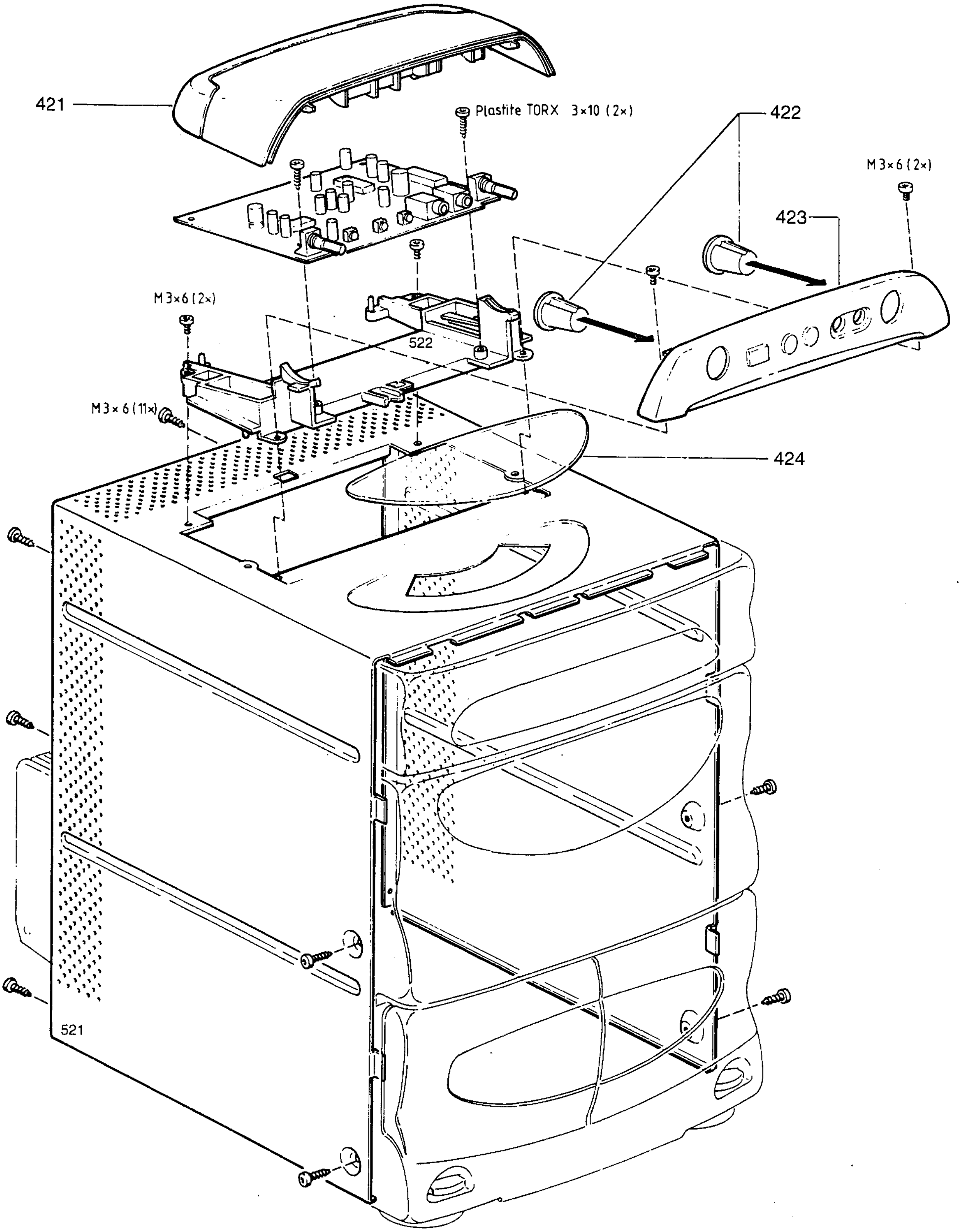
MECHANICAL PARTS

401	4822 444 30512	COVER CDC
403	4822 410 63807	EJECT BUTTON
404	4822 459 04124	FRONT ASSY
406	4822 462 42211	FOOT ORNAMENTAL PART
407	4822 462 40683	RUBBER FOOT
408	4822 459 11086	WORDMARK "PHILIPS"
409	4822 450 62477	WINDOW DISPLAY
411	4822 492 51374	FIXING RING
412	4822 413 51508	KNOB VOLUME
413	4822 443 64506	CASSETTE DOOR LEFT
414	4822 450 62478	CASS. WINDOW LEFT
416	4822 443 64507	CASSETTE DOOR RIGHT
417	4822 450 62479	CASS. WINDOW RIGHT
426	4822 462 10688	COVER HEATSINK
5001	4822 146 10426	MAINS TRAFO
5001	4822 146 10504	MAINS TRAFO only /21/41
5301	4822 146 10437	STANDBY TRAFO
5301	4822 146 10466	STANDBY TRAFO only /21/41

MISCELLANEOUS

4822 445 10504	LOUDSPEAKER BOX
4822 218 10685	RC8082 REMOTE CONTROL
4822 303 50063	FM AERIAL
4822 303 50082	AM FRAME AERIAL
4822 321 10249	MAINS CORD EUROPE
4822 320 11422	CINCH CABLE
4822 736 14203	IFU FW670P/22
4822 736 14303	IFU FW670P/21
4822 736 14351	IFU FW670P/41

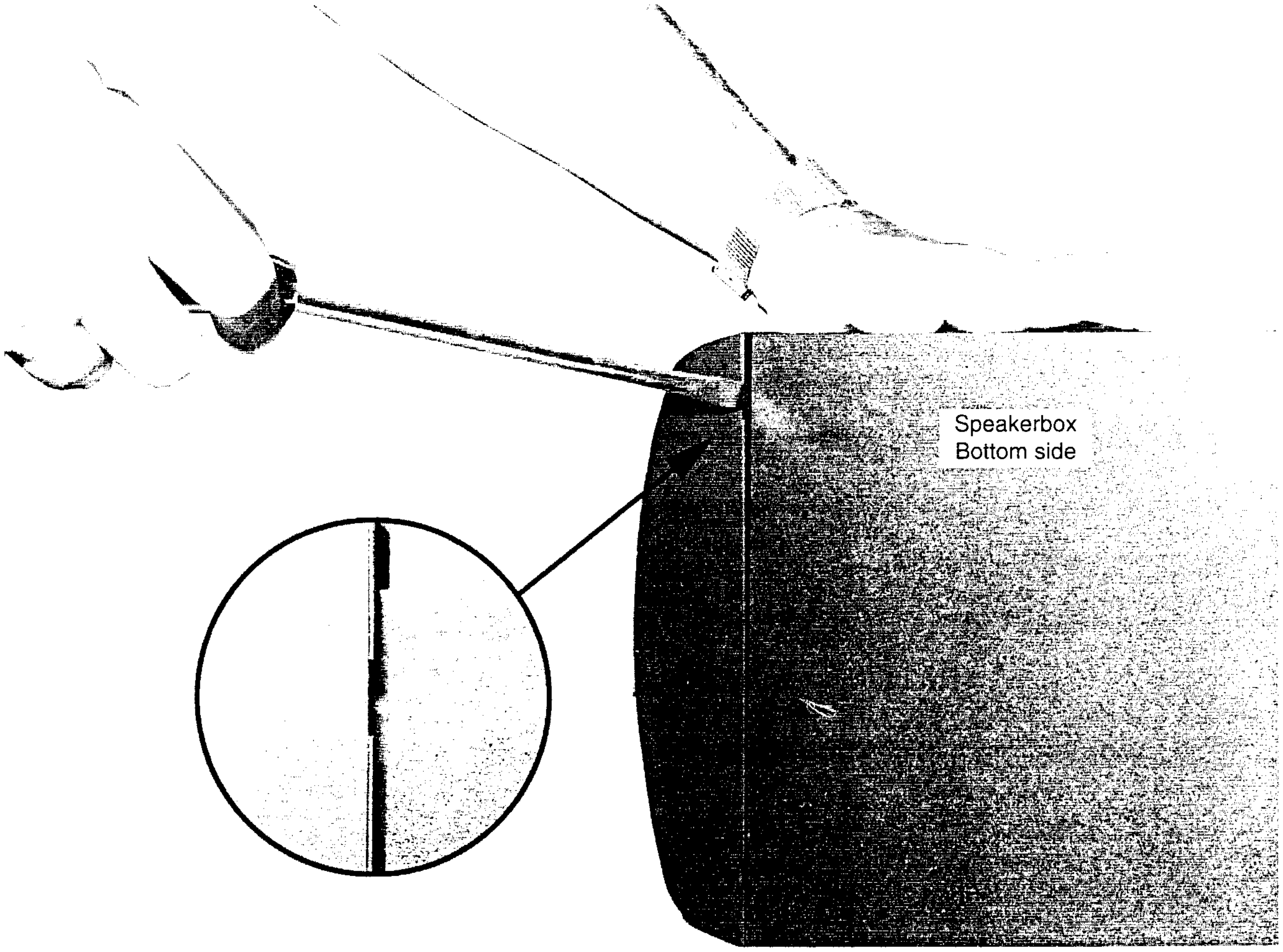
EXPLODED VIEW OF SET II


421
Plastite TORX 3×10 (2×)
422
M3×6 (2×)
423
522
M3×6 (2×)
M3×6 (11×)
424
521

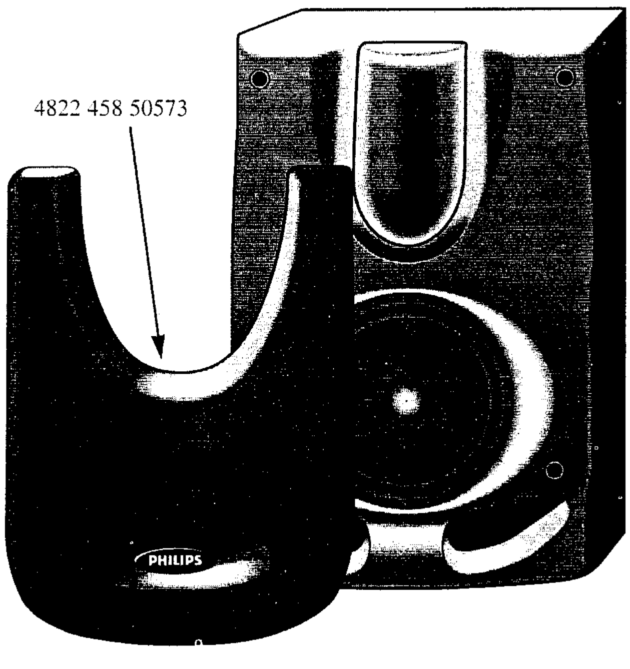
MECHANICAL PARTS

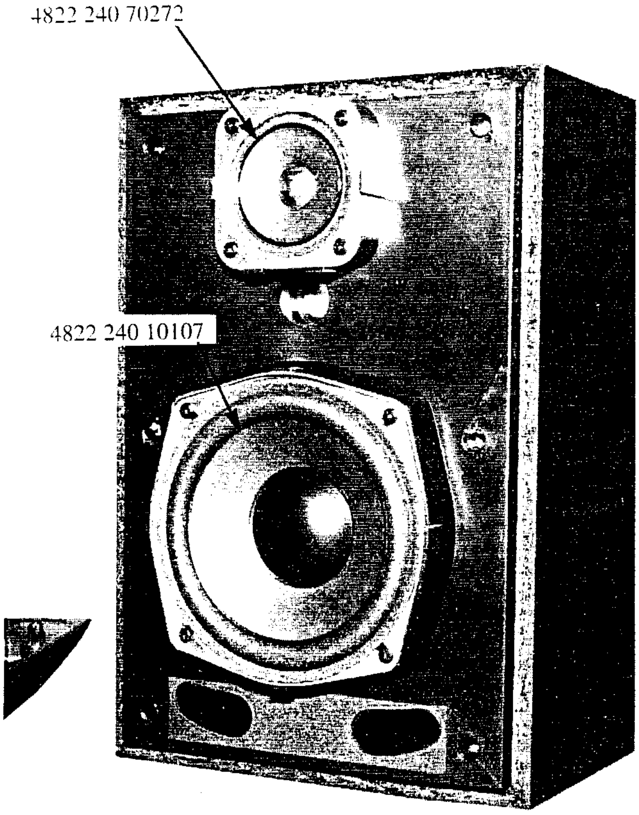
	4822 410 63997	BUTTON VOCAL FADER
421	4822 444 40836	COVER KARAOKE
	4822 532 12421	SPRING KNOB CLAMP
422	4822 413 41916	KNOB KARAOKE
423	4822 426 51868	FRONT KARAOKE
424	4822 450 62481	WINDOW CDC

Dismantling of Speakerbox


Speakerbox
Bottom side

Spareparts


4822 458 50573
PHILIPS


4822 240 70272
4822 240 10107

Service
Service
Service

Product Service Group CE Audio

Service Information

Correction to the Service Manual

In the mechenical partslist on page 13-5 the service codenumber for item 5001 (4822 146 10504 mains trafo only/21/41) is wrong!!

The correct service codenumber should read: **4822 146 10474**